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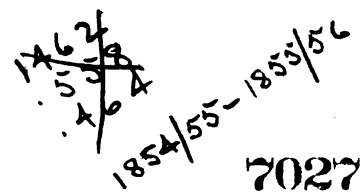

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On Anglo-Saxon Antiquities, with a particular reference to the Faussett Collection.

By Thomas Wright, Esq., M.A., F.S.A., *Corr. Mem. of the Inst. of France.*

(Read 27th September, 1854, before the Members of the Historic Society, and those of the British Association for the Advancement of Science.)

There is scarcely any part of our islands in which we do not find here and there scattered over the surface of the ground, artificial mounds, or tumuli, of various elevations, from one foot, or even less, to more than a hundred. It has been long known that these tumuli covered the last remains of the different peoples who lived here in the ages preceding the introduction of the Christian faith, subsequent to which the interment of the dead was differently regulated. Accidental discoveries must often have brought this truth to light, if the knowledge of it, or at least the belief in it, had not been, as I think there is every reason for believing that it was, handed down to us traditionally from the time at which they were made. In fact, it is no unfrequent occurrence, when we open a tumulus which as far as we could judge from its outward appearance, cannot have been touched for many ages, to find that at some remote period it had been broken into and its contents either abstracted or broken and scattered about. Great numbers of such tumuli have been destroyed unobservedly in the various processes of agriculture or in the adaptation of their site to modern purposes. Others have been opened through mere motives of curiosity, or even of superstition, and any object of interest they contained was carried off under the indefinite character of an old relic. It has only been in more recent times that these monuments have been explored with care and order, in the hope that an intelligent examination and comparison of their contents might make us acquainted with peoples and races concerning whom we learn little from the pages of written history. Thus has the practice of "barrow-digging"—to use the phrase which has become popular within the last few years—passed through three distinct phases; during the first long-extending period its object was mere plunder, consequent on the knowledge that articles of value were often deposited with the dead; during an intermediate period, the object was curiosity; and during the third period, it was knowledge, or, to use at this meeting the more appropriate

word, Science. It is this latter period alone with which we are at present concerned.

The difficulties with which sound English archæology has had to contend in its beginning, arose chiefly from the vague spirit of curiosity which preceded it. Instead of the careful and extensive comparison from which alone we can hope to deduce facts of importance, people looked at each article only with regard to itself; and, for the course of inductive reasoning which science requires they thoughtlessly substituted mere irrational conjecture. This had become a sort of habit. People assumed, without knowing why, that the tumuli of which I have been speaking covered the remains of battle-fields, and never questioning the fable or tradition which made the heroes of these battles Danes or Britons, Saxons or Normans, (popular tradition knew little of Romans), they followed that tradition in calling whatever articles were found in them Danish or British, or Saxon or Norman. It is quite wonderful, when we look back into the writings of the old antiquaries of note, how few escaped from the influence of such popular errors. Although accustomed to classification in other branches of science, they seem never to have thought of applying it to this; and museums were simple collections of curiosities, instead of being the materials for scientific investigation. It may be said to have been in the Anglo-Saxon tumuli of Kent that a better spirit of investigation first showed itself, and that the foundations were laid for the higher cultivation of archæological science which now happily prevails.

There are various circumstances characteristic of the Anglo-Saxon interments, which contributed much towards this result; because they led people almost necessarily to follow a new course of reasoning. The larger and more remarkable tumuli, those which are known to be Roman and those which are believed or supposed to be British, were in general found singly by themselves, or in a group of not more than two or three; they were probably memorials of respect or attachment to persons of distinction, while people in general were buried in a less ostentatious or less durable manner. As the interments had in most cases been preceded by cremation, it was only in particular instances that the contents offered anything remarkable or characteristic. On the contrary, the Anglo-Saxon tumuli are arranged in extensive groups, forming regular cemeteries, each probably belonging to a sept or to a district. Each grave contains almost invariably

a considerable number of articles of very different descriptions, so that the abundance of the objects alone invited to comparison. Another circumstance also has contributed to their preservation. In the Anglo-Saxon interments, the body with the objects accompanying it were laid in a grave, at some depth below the level of the ground, so that the plunderer who sought objects of value, or the collector who sought curiosities, found nothing in the mounds they opened to encourage their researches. From these circumstances, the first correct principles of our national archæology were obtained in the investigation of the Anglo-Saxon cemeteries; and it adds considerably to the interest of the extensive and valuable collection now exhibited to us, that they not only form the finest collection of Anglo-Saxon antiquities of the pre-christian age ever yet made, but that they are those upon which the foundations of our present knowledge were laid.

The Rev. Bryan Faussett, of Heppington, near Canterbury, to whom we owe the formation of this collection, had passed the greater part of his life in a district peculiarly rich in Saxon remains; for the succession of chalk downs stretching out from Canterbury towards the east and south, are remarkable for the numerous groups of Saxon barrows, or rather the Saxon cemeteries, which are found on their slopes and summits. In the year 1730, one of these groups, situated on a high part of Chartham down, somewhat more than three miles to the south-west of Canterbury, was partially excavated by Charles Fagg, Esq., of Mystole, in Chartham parish. These excavations were carried on in a very unsatisfactory manner, under the immediate personal direction of Dr. Cromwell Mortimer, the Secretary of the Royal Society; and so little was then known either of the character of the cemeteries, or of the objects they contained, that the learned secretary of that celebrated scientific body actually wrote an elaborate paper on them, in which he arrives at the conclusion that they were the graves of the soldiers slain in a battle fought here between Julius Cæsar and the Britons. Bryan Faussett, at this time only about ten years old, is said to have been present at the opening of these graves, which excited in him an interest that clung to him during the remainder of his life. He was subsequently curate of Kingston, about five miles to the south of Canterbury, from 1750 to 1755, and while resident there his attention was forcibly rivetted on a very remarkable and extensive group of barrows in his own parish, on the brow of the hill near Ileden. Still possessed by the notion

that these barrows or tumuli marked the site of a battle between Cæsar and the Britons, Bryan Faussett was anxious to open them, but the permission to do so was refused by the owner of the land, Thomas Barrett, Esq., and Mr. Faussett's curiosity remained unsatisfied. At length, in 1757, Mr. Faussett was enabled to gratify his spirit of research in commencing a series of excavations in a cemetery on a spot called Tremworth down, in the parish of Crundale, which however proved to be Roman. His excavations on this site were continued in the year 1759. In 1760, 1762, and 1763, he pursued his researches in the very rich Saxon cemetery at Gilton in the parish of Ash, near Sandwich, where he opened no less than a hundred and six tumuli or graves, which enriched his collection with a number of interesting objects. In 1767, Mr. Faussett's attention was again called to the barrows in Kingston parish, and the land having passed by the death of its former owner and the marriage of his daughter to a personal friend, he obtained at last full liberty to excavate. He was soon convinced of his error in supposing that they had any connection with Cæsar or the Britons, and he obtained from them many of the most precious articles which are now found in his collection. During the autumn of the year just mentioned Mr. Faussett opened fifty-four tumuli on this site. His further researches here were interrupted, for some reason or other, from the September of 1767 to the middle of July, 1771, when he resumed his labours on the same spot, and during that and the following month opened a hundred and sixty-five barrows. In August and October, 1772, he opened thirty-four more tumuli on this spot; and in the August and September of the following year, he examined forty-five more; making in all three hundred and eight separate interments in one cemetery.

Although with Bryan Faussett, the notion that these tumuli covered the remains of Cæsar's soldiers was now entirely exploded, he fell into another opinion equally erroneous, and of which he seems never to have divested himself. He found Roman coins, and he concluded very hastily that the date of their deposit must have been the reign in which they were struck; he found fragments of Roman pottery in comparative abundance; he found a small number of urns containing calcined bones, which he, unable to discriminate the character of the pottery, imagined must have been deposited at a date anterior to that at which the Romans abandoned

the practise of cremation. Against these circumstances Mr. Faussett had to place the absolute uniformity of character of the interments as he found them; and he explained this anomaly by supposing that the coins, urns, &c., were the remains of previous Roman burials, which had been broken up at a later period, in order to use the old graves for a new interment. From these circumstances Faussett concluded that "this spot" had been "no other than a *κοιμητήριον*, or common burying-place; of Romans, no doubt, (and that, too, from a very early period); but not of those alone, but also, if not chiefly, of Romans Britainized, and Britains Romanized (if I may be allowed the use of these expressions), even till long after the Romans (properly so called) had entirely quitted this isle." "In short," he adds, "my opinion of this matter is, that this spot was a burying-place not only, at first, for the Roman soldiers who may be supposed to have kept garrison in some of the many intrenchments and look-outs in this neighbourhood, but that, afterwards, it served for such of the inhabitants of some one or more of the adjacent villages; which we may very reasonably presume were latterly inhabited by what I have presumed before to call 'Romans Britainized and Britains Romanized,' i.e., by people of both nations—who, having mixed and intermarried with each other, had naturally learnt, and in some measure adopted, each other's customs. The ossuaries, or bone-urns, here found, will sufficiently prove that this place was used as such in the time of the higher empire, i.e., before the custom of burning the dead ceased among the Romans; and the coins of Gallienus, Probus, of Carausius and Allectus, and of the Constantine family, will be ample evidence of its having continued to be used as such in the time of the lower empire. How much longer it was put to that use, it is impossible for me to determine from anything yet found there; but my conjecture is that it served for that purpose (I mean, a burying-place for some neighbouring village, or perhaps villages), long after the Romans (i.e., those properly so called) had entirely evacuated and quitted this isle." Mr. Faussett adds that, from the circumstance of a cross-shaped fibula being found in one of the graves, it is plain that the wearer of it was a Christian, and therefore that this cemetery may have been in use until the time when Archbishop Cuthbert, who came to the see of Canterbury in 741, ordered that the burials should take place in cemeteries adjacent to the churches.

I have quoted the whole of this statement of Bryan Faussett's opinions in order to shew you how imperfect the science of archæology was in this country only eighty years ago, and how apt people were to build theories upon what they believed to be facts, merely because they did not themselves know the contrary. Mr. Faussett was ignorant that the Roman coinage of all dates was in general and extensive circulation among the Anglo-Saxons; that great quantities of Roman pottery were in use among them; that the practice of cremation did exist among the Teutonic settlers in this island; that the "bone-urns" which he dug up were all of Saxon, or rather perhaps of Frankish manufacture; and, finally, that the cross-shaped ornaments are so common, and occur under such circumstances, that we cannot possibly take them as any evidence that the skeletons with which they were found were those of Christians.

The years 1772 and 1773 were those of Mr. Faussett's most active researches. In the July of the former of these two years, he began to open a rather extensive cemetery, or more accurately speaking, two cemeteries, on Sibertswold down, about half way between Canterbury and Deal. During the summers of this and the following year, he opened a hundred and eighty-one Anglo-Saxon graves, many of which contained objects of the greatest interest. During the July and August of 1772, Mr. Faussett also opened forty-eight graves in a smaller cemetery on Barfreston down, in the immediate neighbourhood of that at Sibertswold. During the summer months of the year 1773, Mr. Faussett opened forty-four Saxon tumuli in a cemetery in the parish of Beakesbourne, about four miles to the south-east of Canterbury; and in the autumn of the same year, returning to the scene of his earliest antiquarian impressions, he opened fifty-three graves on Chartham downs, in the same cemetery which had, in 1730, occupied the attention of Mr. Fagg and Dr. Mortimer. With these excavations Bryan Faussett's labours seem to have closed. He was probably hindered from continuing them by declining health, as we know that he died within three years after, in 1776.

Bryan Faussett had a successor in these researches, in the Rev. James Douglas, who, in the years 1779 and 1780, assisted in opening a number of graves in a Saxon cemetery on Chatham lines, which was cut through in the course of the military works there. In 1782, Douglas opened some

Saxon barrows at St. Margaret's on the Cliff, near Dover; in 1783, he opened a group in the parish of Ash near Sandwich; and in 1784, he explored a small group in Greenwich park.

The researches of Douglas were far less extensive than those of Bryan Faussett, but they have been better known through the circumstance that the former, towards the end of the century, published the results of his inquiries in a folio volume which has long been advantageously known to antiquaries by the title of *Nenia Britannica*. In attempting to appropriate these remains, Douglas erred in the opposite direction from Bryan Faussett. The latter imagined that they belonged principally to a population which preceded the Anglo-Saxons. Douglas seems himself to have set out with this notion, but he soon relinquished it, and he went so far right that he ascribed them to the Anglo-Saxons themselves. Douglas, however, laboured under certain prejudices and vulgar errors. He imagined that the Saxon settlers, before their conversion to Christianity, were mere barbarians—that they were totally unacquainted with art—and that they were neither capable of making, nor likely to possess, the numerous articles, rich in material and ornamentation, which were found in these cemeteries. Further, he fancied that there was a Byzantine character in the ornamentation, and he immediately concluded that it must be the work of artificers who came to England along with Theodore the Greek in the year 668. He therefore adopted the very untenable theory that these were the graves of Christian Saxons; and that they belonged to the period which intervened between the conversion of the Anglo-Saxons at the close of the sixth century and the middle of the eighth century, when the cemeteries were ordered to be attached to the churches. Nothing can be more evident to the unbiassed observer of these interments than the pagan character of them all.

I have dwelt the more upon the opinions of these first investigators, because in science, the history of error is often as instructive, to the student at least, as the declaration of truth; inasmuch as it teaches him the necessity of caution, especially in a science, like British archæology in its present condition, where there is much room for speculation. From the time of Douglas to our own days, no further researches were made in the Anglo-Saxon cemeteries, and no one attempted to correct or to build upon his labours. Those of Bryan Faussett, which had not been published,

remained unknown, except by a few articles engraved in the plates to the Nenia; Douglas himself having had access to the Faussett collection. So little indeed were the correct principles of archæology understood in this country that a diligent if not a very correct collector of facts, Sir Richard Colt Hoare, who made an unwise attempt at an arbitrary classification of barrows by their outward forms, actually set down the contents of Saxon tumuli as British, although he might have corrected himself by a simple glance at the then very well-known work of Douglas. In 1841, and during several subsequent years, Lord Londesborough (then Lord Albert Conyngham), who was residing at Bourne near Canterbury, and had a rather extensive cemetery in his own park, opened at different times a considerable number of barrows there, at Wingham near Sandwich, and on Breach down in the parish of Barham, about four miles to the south of Canterbury. His lordship was accompanied at most of these excavations by Mr. Akerman, Mr. Roach Smith, or myself, and I believe that Mr. Akerman and Mr. Roach Smith, in giving accounts of those and other discoveries in the same neighbourhood, *first* stated clearly and distinctly to what people these remains belonged, namely, to the Anglo-Saxons of the period previous to the introduction of Christanity; or from the middle of the fifth century to the end of the sixth, and in some parts probably, where Christianity had penetrated more slowly than in others, to the middle of the seventh. The interest excited by these discoveries, called much attention to the subject, and it was soon known that several Anglo-Saxon cemeteries had been partially opened by accident in other parts of Kent, and that the contents had either been scattered abroad and lost, or preserved by private individuals who were not aware of their peculiar character. Thus, a rather extensive cemetery had been opened at different times from 1825 to 1828 at Sittingbourne, and many of the articles found in it were preserved by Mr. Vallance. Mr. Rolfe, of Sandwich, had already begun to form his valuable collection from the cemeteries and barrows at Gilton, Coombe, Woodnesborough, and other places, which has been since so much enriched from his excavations at Osengell. Saxon cemeteries of great interest have been also excavated at Stroud and Rochester; another has been cut through by the railway at Northfleet; and traces of several others have been noticed in different parts of Kent.

You have now before you, in the Faussett collection alone, the contents

of between seven and eight hundred graves, and you will see that, as I have already intimated, they furnish an almost indefinite variety of articles; and this variety would no doubt have been greatly increased but for the perishable materials of which many of those placed in the graves were composed. There are, however, certain classes of articles which are more numerous than the others, and to which it may be well to call particular attention.

The body was usually laid on its back in the middle of the floor of the grave. In the MS. account of his diggings, Faussett frequently mentions traces of the existence of a coffin, but as far as my own experience goes, I am led to think that the use of a coffin was not common. Where the body was that of a man, we almost always find above the right shoulder the iron head of a spear, and in general we may trace by the colour of the earth the decayed wood of the shaft, until near the foot of the skeleton lies the iron-spiked ferule which terminated it at the other end. We sometimes also meet with one or more smaller heads of javelins, or arrows, for I disagree entirely with a statement which has been made lately and adhered to, that the bow was in discredit among the Anglo-Saxons as a weapon.* Closer to the side of the skeleton lies usually (though not always) a long iron broad-sword, not much unlike the claymore of the Scottish highlander, of which it is perhaps the prototype. Its most usual form is that represented in the annexed figure. The sheath and handle appear

1. Sword, from Barham Down.

in most cases to have been made of perishable materials, and we seldom find more than the blade with the spike by which it was fixed into the handle. The tip of the sheath, however, is sometimes found, having been made of bronze or other metal, and also at times, the handle of the sword, which has been found of silver.† A usual form of the top of the handle

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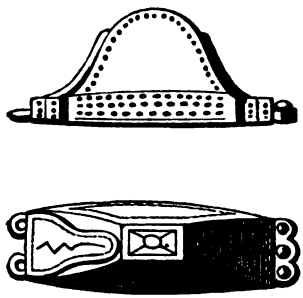
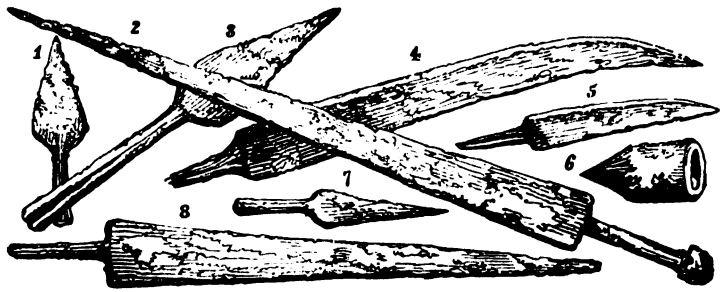
* See on this subject the note at the end of this paper.

† Fine examples of the handle of the Anglo-Saxon sword will be found in the engravings to Mr. Smith's *Collectanea* and Mr. Akerman's *Pagan Saxondom*.



2. Top of the handle of a Sword, from Kingston Down.

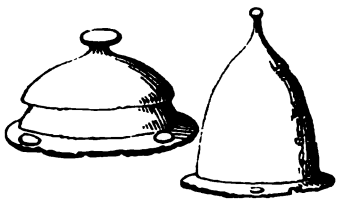
is represented in figure 2. Another article, peculiarly characteristic of the Saxon interments, is the knife, the length of which is generally about five or six inches, although at times it extends to from ten to eleven inches, and then from its shape it must have been a very formidable weapon, independent of its utility for other purposes. It has been pretended that it was from the use of this instrument, called in their language a *seax*, that our forefathers derived their name of *Saxons*. Another weapon, the axe, is found at times in the Saxon graves, but it is of very rare occurrence, and was probably not in general use in this island. The accompanying group of weapons were taken from one grave on Kingston Down: they consist of two swords of rather different form to that represented above (2 and 8); the head (3) and the ferule (6) of a spear; smaller javelins or arrow heads (1, 7); and knives large and small (4, 5.)*



3. Weapons, from Kingston Down.

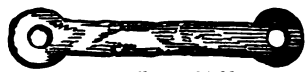
Over the breast of the Saxon warrior is generally found the iron umbo or boss of his shield. Its shape is not always the same, as will be seen by

* Mr. Akerman, Pagan Saxondom, p. 48, has given his opinion that the sword was not an ordinary weapon of our Anglo-Saxon forefathers, and states that its occurrence in the grave is an exception. I confess that my experience does not altogether support this opinion or statement; but I have remarked in more than one instance that the sword was entirely decayed in the same grave where the spear-head was very well preserved, and this to such a degree that it required close observation, and an experienced eye, to detect in the colour of the earth the traces of its former existence. I am not aware whether highly tempered steel undergoes more rapidly the effect of decomposition than steel less highly tempered, or than common iron.



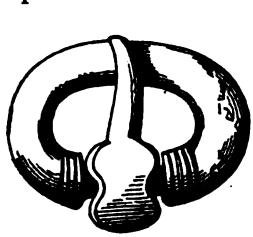
4. Umbos of Shields, from Ash and Chartham.

the examples now exhibited, but there is a general character about this part of the accoutrements of the Anglo-Saxon which makes it perfectly inexcusable for any one who pretends to the character of an archæologist to misappropriate it, as has been done in a recent publication which I regret to say contains too many errors of this kind, I mean Wilson's "Archæology and Prehistoric Annals of Scotland." Beneath the boss of the shield, is usually found a piece of iron which is best described by a drawing, and which no doubt was the handle by which the shield was held. Douglas, who had not observed carefully the position in which it is found, imagined it to be part of a bow, and called it a bow-brace. The shield itself, as we know from the Anglo-Saxon writers, was of wood, generally of linden, and has therefore perished, but we find remains of nails, studs, and other iron work, belonging to it.

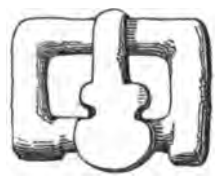


5. Handle of Shield.

Such are the more common arms which we find, without much variation, in the graves of our Anglo-Saxon forefathers, of the period to which these cemeteries belong. The miscellaneous articles are so varied, that I can only enumerate them rapidly. Of personal ornaments, the first that attract our attention are the fibulæ, or brooches, and the buckles. The latter are usually of bronze gilt, and are often very elaborately ornamented, as will be seen by the numerous examples in the Faussett collection. From the position in which they are found, it is evident that they formed, most generally, the fastening of the girdle. The forms of these buckles are varied. The two first examples here given (6) are of a form which is not uncommon. Sometimes they are square, instead of round, as in the example No. 7. The buckle is very commonly only the extremity of a



6. Buckles, from Kingston Down.

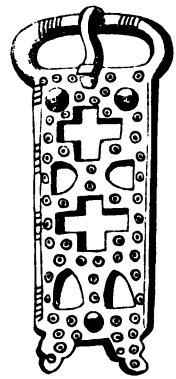


7. Buckle, from Kingston Down.

bronze ornament, more or less elaborate. No. 8, is a small and very plain buckle of this kind. Nos. 9 and 10 are buckles of ornamental forms, which occur not unfrequently both in the Faussett collection, and in other collections made from the Kentish graves. They are sometimes

8. Buckle, from Kingston Down.

9. Buckle, from Kingston Down.



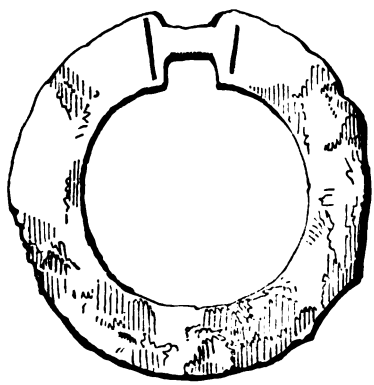
10. Buckle, from Sibertswold.

very massive, the larger ones apparently belonging to the male, and the smaller ones to the female costume.

Many of the fibulæ which are found upon male skeletons, as well as females, are extremely rich and beautiful. In the Kentish tumuli the prevailing form is circular, and they are often of gold, profusely ornamented with filigree work, and with garnets or other stones, or sometimes glass or paste, set usually upon chequered foils of gold. The use of this fibula appears to have been to fasten the mantle over the breast, where it is most commonly found. Some of the finest examples of the Saxon gold fibulæ occur in the Faussett collection. Their general size is from an inch and a half to two inches in diameter; but the Faussett collection possesses one of considerably larger dimensions, which was found in the grave of an Anglo-Saxon lady, on Kingston down. This magnificent ornament is no

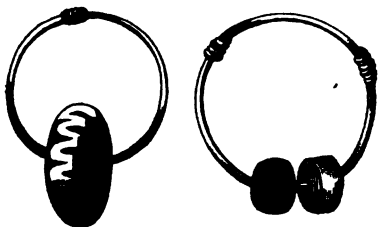
11. The great Fibula, from Kingston Down.

less than three inches and a half in diameter, a quarter of an inch thick at the edges, and three quarters of an inch thick at the centre, all of gold, and weighing between six and seven ounces. It is covered with ornaments of filigree work, in concentric circles, and is set with garnets and with pale blue stones. The acus or pin on the back is also ornamented and set with garnets. It was found high on the breast, near the right shoulder. Other examples of the circular gold fibula will be seen in the Faussett collection, and they are met with in almost every collection of Anglo-Saxon remains from the Kentish barrows. Fibulæ of plainer forms are also of common occurrence, sometimes consisting of a mere circle of bronze, like the example here figured.

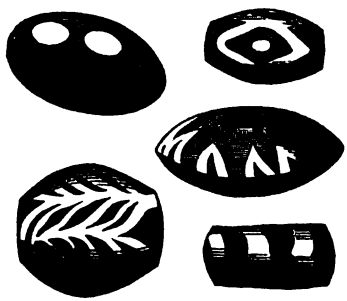


12. Plain Fibula, from Kingston Down.

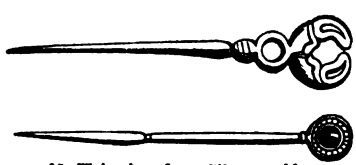
Other jewellery, such as rings, bracelets, necklaces of beads, pendants to the neck and ears, &c., are found in abundance, and in a great variety of form. The ear-rings are very diversified in form, but they often consist of a plain ring with one or two beads on it. Gold coins are sometimes fitted up as pendent ornaments. The most common material of beads is glass or variegated clay, the latter made with great skill, and often exhibiting pleasing patterns. It belonged to a class of manufacture which has continued to exist in this country down to a recent period. Another common material of beads was amber, and we sometimes find small lumps of amber which have been merely perforated, in order to be attached to the person by a string. It must be observed that we sometimes find a string of beads round the neck of a man, and other circumstances shew that there were Saxon *exquisites* who were vain enough of their personal adornments. It is, however, a very usual thing to find one or more beads of amber near the neck in cases where there can be no doubt that the deceased was a man; but this circumstance is explained by a widely prevailing superstition in the middle ages, that amber carried on the person was a protection against the influence of evil spirits. Large hair pins, usually of bone or bronze, and more or less ornamented, are generally found near the heads of skeletons of females, in such a position as leads us to conclude that the Saxon ladies bound up their hair behind in a manner similar to that which prevailed among the Romans.



13. Ear-rings, from Sibertswold.



14. Beads in variegated clay.



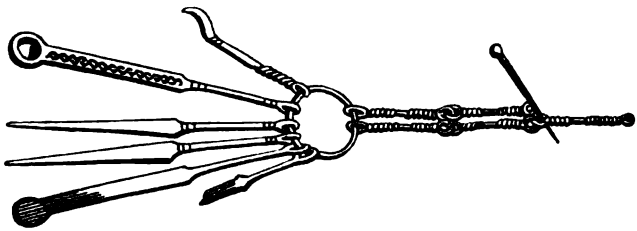
15. Hair-pins, from Sibertswold.

The interments of the Anglo-Saxon ladies are generally accompanied with a number of articles of utility, as well as of ornament. By a lady's side, we usually find the remains, more or less perfect, of a bunch of

domestic implements, somewhat resembling the article brought into fashion a few years ago, under the name of a *châtelaine*. To these were hung,

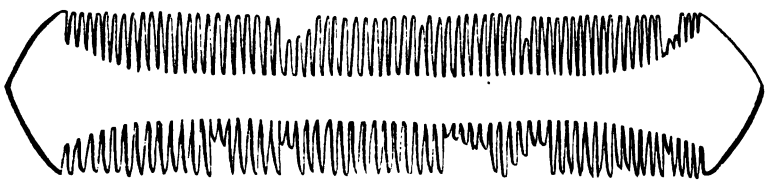
16. Tweezers, from Kingston Down.

among other articles, small tweezers, intended for the eradication of superfluous hairs, which are so common, that it is evident that the practice of depilation prevailed generally among the Anglo-Saxon ladies. Other instruments have evidently served for ear-picks and tooth-picks. The tweezers so closely resemble those found on Roman sites, that we can hardly doubt that it was from the Romans the Anglo-Saxons originally derived them. The cut given as an example is represented here of its natural size. The next figure (17) represents examples of what are believed to have been ear-picks, tooth-picks, &c., as they were found attached to the châtelaine in a grave at Sibertswold. Combs also are found very



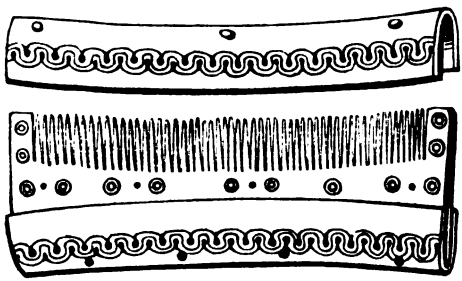
17. Chatelaine, from Kingston Down.

frequently, not only in the graves of women, but in those of men, a proof that the latter, which in fact was the case among all the branches of the Teutonic race, paid great attention to their hair. Those which are preserved are usually of bone, and they are, as at present, sometimes single, and sometimes double. The first of the examples here given, is one of the least ornamental character.

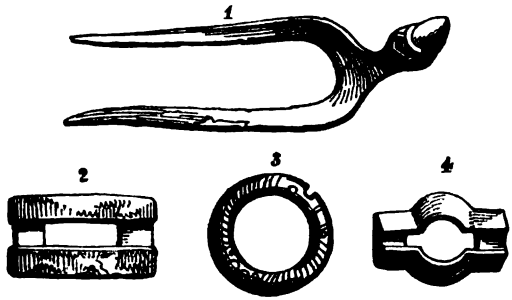


18. Comb, from Kingston Down.

The second (No. 19) is curious on account of the two guards for the protection of its teeth from damage when not in use. It is more than probable, that in many of the graves in which little is found, there were originally combs and other articles of wood, a material which of course has perished long ago, even where it existed in much greater masses. It appears that there was often attached to the châtelaine, or suspended by the side of it, a bag of some kind, containing other articles used by the ladies, for we frequently find on the spot where it has lain a heap of small articles, which are at times tolerably preserved, but in others the iron is so much oxidized, as to present a mere confused mass of fragments. In these groups, which differ much, both in the number and in the character of the articles which compose them, we usually find one or more small knives, and a pair of scissors. The Anglo Saxon scissors of this early period, resemble in form the shears of modern times, though we have found one or two examples of scissors formed like those now in use. We have also pins, and needles, and keys, and other small articles, which I will not now attempt to enumerate. I will mention, however, that you find in the Faussett collection a curious example of a supposed fork, found in one of the graves on Kingston Down. It is represented in the next figure. It constitutes another example of the necessity for careful and extensive comparison before we hazard opinions on the purposes of many of the objects found in the Anglo-Saxon graves. I have been convinced, by Mr. Roach Smith, that the object in question is not a fork, but a totally different thing,—in fact that it is part of the metal tag at the end of the belt. The forked part fitted in between two small plates of metal, forming the two sides, and the small knob remained as the termination of the belt. The construction of this object appears to have been borrowed from the Romans, for among several examples in Mr. Smith's peculiarly rich Museum, one which is in a very perfect condition was found with Roman remains, and others have a mediæval character. A fork, however, has



19. Comb, from Kingston Down.



20. Tag of a belt, and other articles, from Kingston Down.

actually been found in one of the early Saxon graves on Harnham Hill, near Salisbury; and the museum of Lord Londesborough possesses a very curious Anglo-Saxon fork of a later date (the ninth century.) These examples have been supposed to disprove the commonly received opinion that forks were not used in eating at table before the sixteenth century; but I think it more than probable that these single examples of forks furnished from Anglo-Saxon times, as well as others which are mentioned incidentally at a somewhat later period of the middle ages, were not used for eating, but merely for serving out of the dish some articles of food which could not be so conveniently served with any other implement. The other figures (2, 3, 4) in the cut No. 20, are supposed to be parts of a small lock or fastening to a box. Mr. Faussett found several examples of an object

21. Bolt, from Kingston Down.

which is represented in the annexed figure, and which, from its general appearance, seems to have been an internal bolt of a box. Another kind of implement, of which, though there are some varieties, the one represented in the figure (No. 22) is a common form, is also found frequently, and can only at present be explained by supposing it to be a key. These were perhaps used to fasten or unfasten internal bolts in boxes like those just mentioned.

22. Supposed Key, from Kingston Down.

A great variety of household utensils, of different kinds, are also found in the Anglo-Saxon graves. The pottery, when not Roman, is of a rude construction, and, in fact, it is not very abundant, for our Anglo-Saxon forefathers, for several ages after their settlement in this island, seem to have used principally pottery of Roman manufacture. I would merely call your attention to the particular character of several earthenware urns, found in Kent, which Bryan Faussett supposed to be early Romano-British, and of which I shall have to speak again further on. But if the Anglo-Saxon earthenware was rude and coarse in its character, the case was quite different with the Anglo-Saxon glass, which is rather common in the graves of Kent. The glass of the Anglo-Saxons is fine and delicately thin. It is found chiefly in drinking cups, though a few small basins and bottle-shaped vessels of glass have been found. The drinking cups are in shape either pointed at the bottom, or rounded in such a manner that they could never have stood upright, a form which it is supposed was given them to force each drinker to empty his glass at a draught. This practice is understood to have existed down to a much later period, and it is said to have given rise to the name *tumbler*, applied originally to a drinking glass which was never intended to stand upright. The ornamentation of the Anglo-Saxon glass, generally consists either of furrows on the surface, or of strings of glass attached to the vessel after it was made. Both these ornaments seem to come fairly under the epithet "twisted," which is often applied to drinking cups in the earliest Anglo-Saxon poetry that has been preserved.

Bowls, large basins, and dishes, of metal, are not unfrequently found in these graves, of such elegant form that we can hardly help supposing them to be of Roman manufacture; and in one instance a bowl of apparently Roman workmanship, was found mended with what were as evidently Saxon materials. Others, however, seem to be Saxon, and prove certainly that the Anglo-Saxons had skilful workmen. These bowls, basins, and dishes,

are usually of bronze, and are often very thickly and well gilt. The metal is generally thin, and it may be remarked as a particular character which distinguishes Anglo-Saxon workmanship from Roman, that the substance is usually thin instead of being massive.

There is another domestic implement which requires particular notice, and which is not uncommon in the Kentish Saxon graves. I mean a bucket, of which, as it has been made generally of wood, there seldom remains more than the hoops, and other bronze or iron work. One, engraved by Douglas, seems to have been composed almost entirely of brass, or bronze, and iron. The use of these buckets has been the subject of conjecture and of very contrary opinions; but I am inclined to believe that each was the vessel called by the Anglo-Saxons a *fæt*, or vat, and that its use was to carry into the hall, and convey into the drinking cups of the carousers, the mead, ale, or wine, which they were to drink. These buckets generally possess too much of an ornamental character to have served for any purpose of a less honourable description. The early Anglo-Saxon poem of Beowulf, (l. 231,) in describing a feast, tells us how

byrelas sealdon win of wunder-fatum.
cup-bearers gave the wine from wondrous vats.

These vats or buckets are never large. The one engraved by Douglas was only seven inches and a half high; another found in Bourne park, the largest I have seen, was about twelve inches high.*

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* I believe I first suggested, in the *Archæological Album*, this use of the bucket, and it seems to have been generally adopted since; but it has been very recently disputed by Mr. Akerman, in his Pagan Saxondom, p. 56. "These vessels," Mr. Akerman remarks, "have been supposed to have been used to hold ale or mead at the Anglo-Saxon feasts, an opinion to which we cannot subscribe. It has been conjectured that the passage in Beowulf—

byrelas sealdon win of wunder-fatum.
cup-bearers gave wine from wondrous vats,

alludes to them; but it is difficult to conceive how the term "wondrous" could apply to utensils of this description, while the huge vats of the Germans are to this day the wonder of foreigners."

One would really imagine that Mr. Akerman was joking with my very literal translation of the passage in the Archæological Album; he certainly has taken a wrong impression of the meaning of the original, by arguing on the common modern usage of the English words. *Wunder-fatum* is certainly represented word for word by *wondrous vats*, but the 'vats' of the Anglo-Saxon poet were not such implements as we call by that name now,—*fæt* was the term applied very generally to almost any kind of vessel. Neither would the Anglo-Saxon *wunder* have presented any difficulty to those who are acquainted with the Anglo-Saxon language, and more especially with its poetry: it simply indicated something excelling in beauty, or form, or some other qualities, the

I will only mention, as a further illustration of the great variety of articles which are found in these Anglo-Saxon graves, and which shew us how little we have hitherto really understood of the degree of civilization existing among the Anglo-Saxons before their conversion to Christianity, that with one interment has been found a pair of compasses. A small pair

23. Dice from Kingston Down.

of dice, found in a grave on Kingston down, leave no doubt that the Anglo-Saxons possessed even the vices of civilization, and that one of these was gambling. In several instances scales and weights have occurred. Mr. Rolfe obtained from the interesting cemetery at Osengell a pair of delicately formed bronze scales, with a complete set of weights, all formed from Roman coins. You may observe a set of such coin-weights in the Faussett collection. This leads me to recur to a former statement of the not unfrequent occurrence of Roman coins in these Anglo-Saxon graves, and we have other reasons for believing that Roman money was long in circulation after the Romans

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common examples of the same article, and the real meaning of the words might be given in the English "very beautiful vessels," or "very elegant vessels," which, according to Anglo-Saxon notions of beauty and elegance, is a sufficiently exact description of the buckets of which we are speaking. One thing is certain, that the Anglo-Saxon poet who wrote these lines, never imagined that he would be taken as intimating that every time the cup-bearers went round to pour liquor into the cups of the guests, each carried a duplicate of the great tun of Heidelberg in his hand.

Mr. Akerman goes on to say:—"In a recent communication with which we have been favoured by the Abbé Cochet, he mentions the fact of his finding in the cemetery of Envermeu a bucket containing a glass cup, and hence concludes that the problem of the use of the former is solved, and that they are, in fact, drinking cups. With all deference for this opinion, we have arrived at a different conclusion. In the Frank graves at Selzen, glass drinking cups were found, protected in a similar manner, but does it not lead to the inference that the larger vessel was intended to hold *food* and not drink? From the circumstance of their being discovered in the graves of either sex, it seems highly probable that these buckets were used for *spoon-meat*, and are, in fact, porringers."

I must confess that I cannot at all understand the train of reasoning by which Mr. Akerman arrives at these inferences and probabilities, which appear to me to be mere gratuitous assumptions. He seems to argue, moreover, as though the worthy and learned Abbé and I had supposed that these buckets were drinking vessels, which is not the case; but I must say, that until I see better reasons against it than are advanced here, I feel inclined to adhere to the explanation I have suggested, which seems to me a very natural and reasonable one. I agree with the Abbé Cochet that the finding of the drinking glass in the bucket is to some degree a confirmation of my opinion, as it seems to imply a connection between the uses of the two articles. Mr. Akerman should have given us some authority for believing that the Anglo-Saxons did eat *spoon-meat* in the way he seems to suppose, or that any people in Western Europe ever eat out of buckets. I have been reminded that the practice of serving out the ale or other liquor in vessels closely resembling the Anglo-Saxon buckets still prevails in England, with the only difference that these vessels are made of tin, and that, instead of being named buckets or vats, they are simply called cans.

relinquished the island. Coins even of the eastern emperors were brought hither, perhaps by traders, long after the fall of the empire of the west. In one of the graves at Osengell was found a gold coin, in a very perfect condition, as though it had not long left the mint, of the Emperor Justin, who reigned at Constantinople from 518 to 527. We know that the early Anglo-Saxon coins, known as *sceattas*, were copied from the Roman coinage, principally from the coins of the Constantine family, which were so largely circulated in this country. These *sceattas*, which were of silver, have been found in the Kentish graves. In a grave opened by Lord Londesborough's directions, on the Breach down, the remains of what appeared to be a small purse presented themselves, among which were four silver *sceattas*. Coins of the Merovingian dynasty of the Franks are also found, and in the Faussett collection there was one of Clovis. Setting aside all other evidence of the date to which these interments belong, the comparison of these coins is decisive. Having alluded to the presence of coins which must have been brought hither from Constantinople, I must also mention the by no means unusual occurrence of an article which we should certainly not have expected to find there, namely, cowrie shells, which I believe are only found on the shores of the Pacific. Several of these will be observed in the Faussett collection.

You will bear in mind that all I have yet said relates to the contents of the Anglo-Saxon cemeteries found in Kent, and I must now recall your attention to the particular construction of the Anglo-Saxon grave. The barrows of other peoples are generally raised above ground, without any, or with very slight excavation, and the interment was usually placed on the surface of the ground. The Anglo-Saxons, on the contrary, dug a rather deep rectangular grave, sometimes small, but often of considerable dimensions; that from which Mr. Faussett procured his largest gold fibula was six feet deep, ten feet long, and eight feet broad, and one, at the opening of which I assisted, in Bourne park, was fourteen feet long, more than four feet deep, and about eight feet broad; the deposit was laid on the floor of the grave, which was then filled up with earth, and a mound raised above it. The pagan Saxon graves were in fact exactly the type of our ordinary churchyard graves, except that the mound was circular and generally larger. The circumstances of the interment are often interesting, though they have been hitherto less noticed than the articles found in the grave. In general,

each grave contains only a single skeleton, but this is not always the case, and in some of the graves at Osengell, in the Isle of Thanet, which I assisted in opening with Mr. Rolfe, a grave contained two, or even three bodies. In the arrangements of such interments I remarked evidences of domestic sentiment of the most refined character. Where two bodies were laid in one grave, they were generally those of a male and female, no doubt of a man and his wife, and they were usually laid side by side, and arm in arm, with their mouths turned towards each other, and close together, as though taking a last embrace. In one grave I found the bodies of a man and his wife, and daughter, a little girl, as appeared by the remains of her personal ornaments. The lady lay in the middle, enfolding in her right arm the left arm of her husband, and holding with her other that of her daughter. We are led almost naturally to ask, what event can thus have swept over the homestead, to have destroyed perhaps whole families together? for from the appearances of the grave, I am satisfied that in each case the whole interment was made at once. Perhaps it was a destructive pestilence; or, when we consider that this cemetery crowned an extensive down which overlooked the sea, it may have been equally ruthless pirates, who, in their sudden descents on the coast, spared neither age nor sex, leaving, on their departure, husbands, and wives, and children, to receive interment together from the hands of those who had escaped the scourge under which they fell.

There is another circumstance which I have remarked not unfrequently in the Kentish cemeteries, where the mound was of any magnitude. When the workmen opened the mound, human bones appeared here and there scattered about in it in a manner which led us at first to suppose that the grave had been opened before, and almost caused us to desist from exploring it further. When, however, we opened the grave itself, we found that the original deposit had not been disturbed, and that the few bones found in the mound must have been deposited there quite independent of it. This has occurred to me so often, that I think it cannot be accidental, and I am inclined to believe that, at all events in certain cases which we have not the means of knowing, it was the practice to kill a slave or a captive, and throw his remains into the mound as a sacrifice to the spirit of the tenant of the tomb below.

The cemeteries in eastern Kent, lying generally upon downs which had

never been cultivated, and where, except at Osengell, the mounds still remained over the graves, are easily discovered, and attracted early attention. But in other parts of the kingdom, where the ground has long been under the process of agriculture, and the mounds thereby entirely cleared away, the existence of Anglo-Saxon cemeteries can only be brought to light by accident. Thus, although single articles which we now know belonged to the period of the Anglo-Saxon pagan interments were met with from time to time, and found their way into museums, as odd things which nobody clearly understood, the existence of the numerous cemeteries which have since been discovered was not even suspected. When, however, the researches of Lord Londesborough called more attention to the subject, closer observation soon led, not only to the knowledge that such cemeteries had been found and destroyed, and slightly or imperfectly recorded, but to the discovery of a number of others which had never been touched. Several had been discovered years ago in Leicestershire, and a few articles found in them were engraved by Nichols. More recently, a very extensive cemetery had been broken into and destroyed at Marston Hill, in Northamptonshire, some of its contents being fortunately preserved; and previous to this, a less extensive one had been broken into at various times at Badby, in the same county. An account of the cemetery found at the former place has since been published in the "Archæologia" by Sir Henry Dryden. An extensive burial site, of a similar character, was explored by Mr. Dennett, on Chessell Down, in the Isle of Wight.

In the year 1844, a cemetery was discovered at the village of Kingston, near Derby, where, in every case, cremation had preceded interment, and where consequently, all that remained to identify the people to whom these belonged, was the pottery of the sepulchral urns, which was itself of an unusual character. It was supposed generally to be British, but Mr. Roach Smith immediately suspected and afterwards satisfied himself that it was Saxon; yet I believe that for some time Mr. Smith and myself were alone in asserting its Saxon character, and even those whose belief in its British character was shaken, could only be induced to yield so far as to call it "supposed British." Subsequent comparison, however, and especially the discoveries of the Hon. Mr. Neville, have left no doubt whatever of its being purely Anglo-Saxon. This pottery, which will be best understood by the figures, is peculiar in form, and ornamented with circles, stars,

24. Urn, from Kingston, near Derby.

25. Urn, from Little Wilbraham.

lozenges, and other marks, stamped on the surface in regular order, as though with the end of a stick, and it is especially characterised by bulges or protuberances on the sides. It has since been found more or less in most of the cemeteries in East Anglia, and it is a curious circumstance, that in Beowulf, which is understood to have been originally an Angle poem, the heroes are represented as burning their dead; so that cremation was probably the practice originally of that Teutonic tribe at least, if not of the others. A cemetery discovered near Newark contained, like that near Derby, nothing but urn-burial, and similar deposits of the Anglo-Saxon period have been found in Warwickshire.

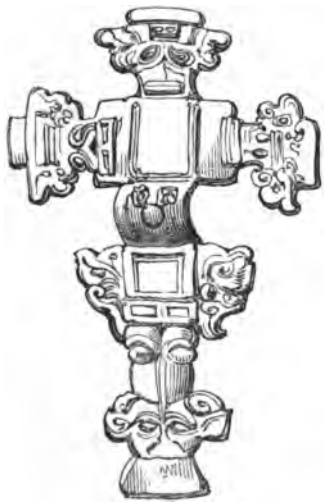
Among the more interesting of recent discoveries I must particularize the small cemetery at Fairford, in Gloucestershire, opened by Mr. Wylie, and the very extensive ones at Great and Little Wilbraham opened by Mr. Neville. But such discoveries have become now so numerous, that it will be sufficient on this ocsasion to give a bare enumeration of them. We will begin with the extensive cemeteries at Great and Little Wilbraham, in Cambridgeshire; at Linton, in the same county, and at Stowe Heath, near Icklingham, in Suffolk, and others of various extent which have been opened or traced at Staunton, Aldborough, Ixworth and Eye, in the county last mentioned; at Walsingham, and near Swaffham, in Norfolk; and at Sandby and Shefford in Bedfordshire. All these belonged to the kingdom of the East Angles. In the extensive inland district occupied by the Mercians, who were chiefly of the Angle race, cemeteries have been found at Caenby; at Castle Bytham, near Stamford; in the neighbourhood of Newark; and at Searby, near Caistor, in Lincolnshire; near Ottgrave, in

the county of Nottingham; at Kingston, and in parts of the Peak, in Derbyshire; at Ingarsby, Great Wigston, Queenboroughfield, Rothley Temple, and Billesdon, in Leicestershire; near Warwick, at Churchover, and Cestersover, in Warwickshire; at Marston Hill, Badby, Hunsbury Hill, and Barrow Furlong, in Northamptonshire. Others, found near Abington, and at Long Wittenham and Blewbury, in Berkshire; at several places in Hampshire; at Harnham Hill, and near Devizes, in Wilts; and probably those at Fairford, and elsewhere, in Gloucestershire; at Mentmore, and Dinton, in Buckinghamshire; and at Souldern, and Cuddesden, in Oxfordshire; belong to the West Saxons. Of the Northern Angles we know only a very interesting cemetery at Driffield, in Yorkshire, and a few scattered remains which have been dug up from time to time in the north-eastern counties of England, and in the Lowlands of Scotland. A few Anglo-Saxon remains have been found in the neighbourhood of Colchester, and in some other spots in Essex, which we must, of course, ascribe to the East Saxons.

It will be seen at once by this enumeration, comparing it with what has been found and what is daily being found in the county of Kent, that there must be a great number of Anglo-Saxon cemeteries scattered over this island of which we yet know nothing. It is desirable, therefore, that we should spread abroad as much as possible, the knowledge of these, which may only be called *our* national antiquities. From the circumstance I have impressed upon your attention,—that the discovery of a spear head, or a sword, or of the boss of a shield, or of any other article which you know to be Saxon, is not the mere obtaining of that article itself, but is probably the indication of an extensive field of discovery, whoever finds that indication should, if possible, carefully mark the spot, and cause the ground to be trenched. It is desirable, for reasons I am going to show to you, that we should extend our knowledge of this class of antiquities as much as possible.

We learn from our oldest authority on this subject, the historian Bede, that the Teutonic settlers in this island consisted of three different branches or tribes of that race; the Jutes, who established themselves in Kent, in the Isle of Wight, and on a part of the opposite coast of Hampshire; the Saxons, who formed the three small states of the East Saxons, the Middle Saxons, and the South Saxons, and the far more extensive one of the West Saxons; and the Angles, who, as East Angles, Mercians, and Northumbrians, occupied a still larger portion of the surface of modern England.

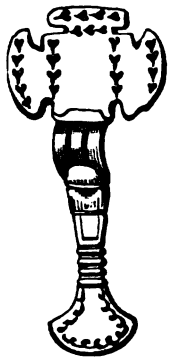
It becomes interesting to us to know if there are peculiarities in the remains found in the Anglo-Saxon graves which correspond with the ethnological division given us by the historian, for it is in this manner that the science of archæology becomes serviceable to ethnology and to history. This question will only be fully ascertained by more extensive researches, and by careful observation; but certain peculiarities have already been remarked which lead us to expect that such researches will be ultimately crowned with important results. I have already stated that the practice of cremation of the dead and urn burial distinguished the Anglian race from the Kentish Jutes, and apparently from the Saxons. This practice seems, among the Angles themselves, to have prevailed in particular districts more than in others, which perhaps indicates smaller divisions of race, a subject into which I will not attempt at present to enter. You will observe in the collection before you, that the fibulæ of the people of Kent were almost all round, the few examples of fibulæ of other forms found in the Kentish graves being evidently importations. Now, when we turn to the collections made from the graves of East Anglia, such as that of Mr. Neville, we find the fibulæ assuming a totally different form, which has been termed cross-



26. Large fibula, from Stow Heath.

27. Large fibula, from Little Wilbraham.

shaped, because the general outline is that of a single or double cross



28. Example of small fibula, from Stow Heath.

There is a marked difference between two varieties of this fibula, the larger ones and the smaller ones; the former are sometimes of extravagant dimensions. I believe examples have been met with, nearly, if not quite, a foot in length. Both are made of bronze or copper, and the large ones at least, have in general been highly gilt. The round fibula is rarely found in an East Anglian grave. As far as observation has yet gone, these cross-shapéd fibulæ prevail wherever the Angle race settled. They were used in Mercia certainly; indeed, some of the finest examples of the large cross-shaped fibula have been found in Leicestershire. We are as yet but little acquainted with the Northumbrian graves, but as far as our knowledge goes, these same cross-shaped fibulæ, identical both in make and ornament, are found there also.* Again, when we look to the collections from the graves in the West of England, from Hampshire to Gloucestershire, we find a round fibula prevailing, but differing in character from anything we have seen before. From its form it has been called

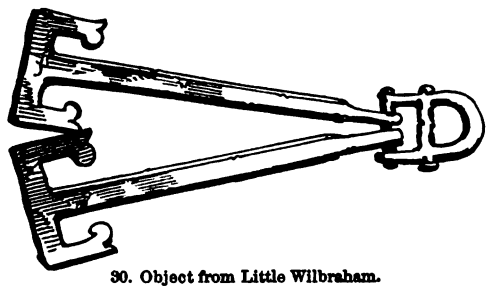
29. Fibulæ, from Fairford, Gloucestershire.

cup-shaped, but saucer-shaped would perhaps give a better description of it. It is usually of copper, gilt, and the field is variously ornamented, not unusually with a rude figure of a human face in the centre.

Thus we observe at the first glance, in one article alone, a very remarkable variation in form, extending exactly over the districts which the early historians give as the limits of the three great branches of the Anglo-Saxon race; the elegantly ornamented round fibula of gold and precious stones of

* Excavations made in the Isle of Wight by Mr. Hillier, since the above was written, show that the Saxon population of that island used a cross-shaped fibula, but it differed from that of East Anglia, a little in the character of its ornament, and entirely in its material, all the examples found by him being of silver, gilt.

the Jutes of Kent, the cross-shaped fibula of the Angles, and the cup-shaped fibula of the Saxons of the West. I have no doubt that we shall gradually discover differences in other articles equally distinctive; for as yet we have much to learn in this class of antiquities. Several articles have already been found of which the exact purpose is not yet clear, and will only be ascertained by more extensive comparison, and by the results of future excavations. Of these I will only allude to one, which shews us the necessity of caution in guessing at the meaning of things we do not understand. A curious implement had been from time to time found with Anglo-Saxon remains in different parts of Anglia and Mercia. It was conjectured that these articles might be latch keys, and they were commonly set down as such; but there is nothing in their appearance to lead us to any distinct notion of the purpose for which they were intended, and they had been obtained so carelessly that it was not observed that they usually occur in pairs. At length a discovery was made at Searby near Caistor, in Lincolnshire, which at least helped us forward a step in explaining it. Two of these so-called latch keys were found fixed together with a bow of metal. From this moment it became quite evident that they were not keys. Numerous pairs of these articles,

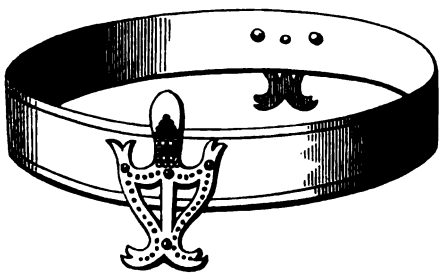


30. Object from Little Wilbraham.

one of which is represented in the annexed figure, have since been found at Little Wilbraham, and may be seen in Mr. Neville's museum, and from the position in which they appear to have lain, and other circumstances connected with them, I believe that Mr. Roach Smith has hit upon the right explanation, namely, that they are the tops or handles to bags or purses, or to *châtelaines*, which were pendent to the girdles of the Anglian and Mercian ladies. Here, then, we have another article of costume peculiar in form to the Angles, and not found in the same form among the Jutes or the Saxons.

It is thus that, in these researches, as new discoveries are made, we arrive step-by step at truth. I will mention one other, and a very remarkable instance of the errors which are apt to arise from careless observation, and of the necessity of extensive comparison. On the Continent, as in England, Teutonic graves had from time to time been accidentally opened, and articles taken from them had found their way singly into museums, where they were looked upon as a sort of nondescripts. A Prussian collector named Houben, at Xanten, the site of a Roman station in the Rhenish provinces, in a book on the antiquities of that site published in 1839, engraved a skull with the brow encircled by a bronze crown, which had been found in a grave with articles of undoubted Teutonic character. There was something so romantic in the idea of this grim old king of the Teutons whose love of royalty was so great that he carried his crown with him even into the tomb, that no one dreamt of doubting the truth of Houben's statement. So much indeed were scholars thrown off their guard by it, that one of the most distinguished of the French antiquaries of the present day, the Abbé Cochet, having obtained from a Frankish cemetery

31. From Xanten, in Prussia.

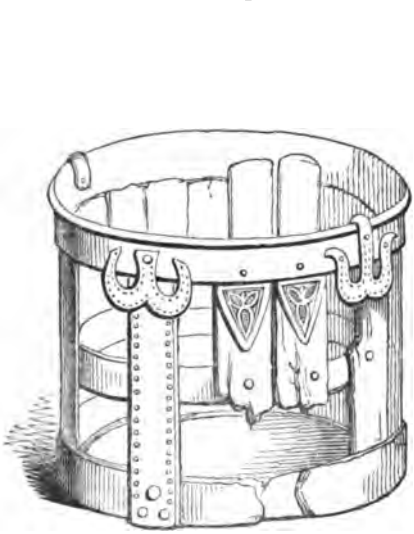


32. From the Valley of the Eaulne, Normandy.

in the valley of the Eaulne a hoop of a not dissimilar character, was inclined to adopt at first the explanation hazarded by the person who took it out of the earth, that it was a "*coiffure ou couronne.*" The correct explanation, however, had already been given by Mr. Roach Smith in his

Collectanea Antiqua. All the different parts of the supposed crown and coiffure had indeed been found in Anglo-Saxon graves in different parts of England, and all more or less connected with the remains of buckets. In fact you will recognise the principal ornament of Houben's crown among the fragments in the Faussett collection, in a portion of a bucket found in a grave on Kingston Down, represented in figure 33. An ornament resembling the similar ornament on figure 32, was pointed out by Mr. Roach Smith as having been found on Stowe Heath. Lastly, another portion of the ornamentation of Houben's crown, the triangular ornaments round the rim, were pointed out by Mr. Smith in a bucket found at Wil-

33. From Kingston Down, Kent.



34. Bucket, from Wilbraham, Cambridgeshire.

35. Bucket, from Envermeu, Normandy.

braham in Cambridgeshire, which is represented in our cut, fig. 34. More recently, the Abbé Cochet has entirely satisfied himself of the correctness of Mr. Roach Smith's explanation, by the discovery, in a Frankish grave at

Envermeu in Normandy, of a bucket nearly entire, with precisely the same ornament as that of the supposed coiffure found in the valley of the Eaulne. The Abbé has given an engraving of this bucket in the second edition of his most interesting and valuable work, *La Normandie Souterraine*, which by his kind loan I am enabled to reproduce here, (figure 35.) A comparison with the Teutonic remains in our island has thus solved the riddle. This crown of the German king, this *coiffure* of the Frank, were neither more nor less than the rims of buckets, such as are found not uncommonly in the cemeteries of Kent and East Anglia. One of Houben's diggers had no doubt put the rim of the bucket on the skull, to mystify his employer.

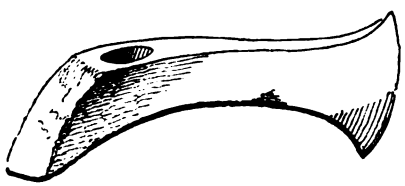
Unfortunately, until very recently, scarcely anything has been done in investigating the remains of the Teutonic tribes on the Continent which answer to those of the Anglo-Saxon cemeteries. The barrows of the districts which were occupied by the Jutes, Saxons, and Angles, before they came hither, and which therefore must possess so great an interest for us, are I believe altogether unexplored. For Germany, the only book to which I can point, which is a very valuable one, is the account of the Teutonic cemetery at Selzen on the Rhine, published by the brothers Lindenschmit in 1848. A similar cemetery near Lausanne in Switzerland has been explored by M. Troyon; and we have been made acquainted with the contents of the Frankish cemeteries in France by the labours of M. Baudot, Doctor Rigollot, and especially by the Abbé Cochet in his work, *La Normandie Souterraine*, already mentioned. The discoveries of the brothers Lindenschmit and of the Abbé Cochet are of particular interest to us in regard to our Anglo-Saxon cemeteries, with which the interments at Selzen are as nearly as possible identical. I will merely observe that, if there had remained any doubt as to the pottery found near Derby and in other parts of Mercia and East Anglia being of the Saxon period, it would have been entirely dispelled by a comparison with that found at Selzen; and point out the complete identity between the Saxon and German glass. The various forms of drinking cups, as well as their ornamentation, are the same in England and in Germany. The example to which I will call your attention is one of a very remarkable kind. In several parts of England, examples have been found of a singularly shaped glass vessel, ornamented externally with knobs of the same material. One of these has been found by Mr. Wylie, in Gloucestershire, and is

figured in his book on the Fairford Graves; another has been found in the county of Durham, and Mr. Joseph Clarke has the fragment of a third found in Hampshire. There is a fourth in the Faussett collection; and a fifth, which was found near Reculver, in the museum at Canterbury. One of these same glasses was found in a Teutonic grave at Selzen; and another, engraved by the Abbé Cochet, was met with in the Frankish cemetery in the valley of the Eaulne. The

1. Reculver, Kent. 2. Selzen, Germany. 3. Fairford, Gloucestershire. 4. The valley of the Eaulne, France.

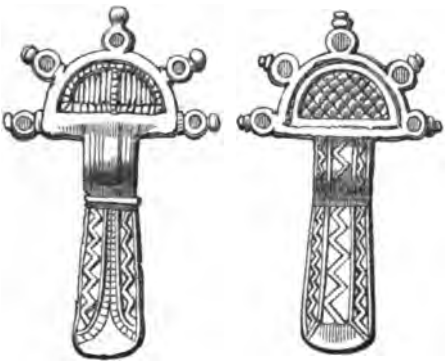
36. Anglo-Saxon, Old German, and Frankish Glasses.

identity of these glasses, as well as of the drinking glasses of the more usual forms, is so complete, that I believe they must have all come from the same manufactories; and I think it probable that the Anglo-Saxons and the Franks at this early period obtained their glass from works at Mayence and along the Rhine. I would further observe that I have seen vessels of glass which were dug up at Mayence and were evidently of very late Roman manufacture, which displayed many of the peculiar characteristics of the glass found in the Teutonic graves. On the other hand, the cemetery at Selzen presents examples of jewellery and goldsmith's work of such a character as would lead us to suppose it was brought from Kent. The Frankish cemeteries are interesting to us because they shew us whence a few articles of rarer occurrence in the Kentish graves were procured, such as the battle axe, or *francisque*, a particular shaped long fibula, and the few examples of burial urns. I give here an example of the form of the first of these articles which seems to have been most common among the Franks—it was found by the Abbé Cochet at Londinières on the river Eaulne. Axes identical in form with this



37. Battle-axe, from Londinières, Normandy.

have been found in Kent, but they are of rare occurrence, and evidently could not in this country be called a national weapon. The fibulæ to which I allude are very peculiar in form, and evidently belong to the Continent, though a small number of examples have been found in England, chiefly in Kent. One of the examples here given (1) is from Osengell in the isle



1. 2.

38. Fibulæ, from Osengell and Selzen.

of Thanet; the other (2) is from Selzen in Germany. Their identity of character strikes us at once; and it is remarkable that this is a prevailing form of fibula in the Frankish graves. I have already alluded to the urns in the Faussett collection; the two examples here given, from among those found by the Abbé Cochet in the cemetery in the valley of the Eaulne,

39. Urns, from the valley of the Eaulne.

will enable us to satisfy ourselves of their perfect identity with the few Kentish urns, and it is probable indeed that the latter were imported from France. At all events, they differ much from the Anglian urns, of which we have given examples before. In these Frankish urns we can trace an evident, though rude, attempt to imitate the ornamentation of Roman

pottery, and in some instances we have even a copy, more or less perfect, of the well-known egg-and-tongue pattern. The latter is sometimes intermixed with other forms in a very incongruous manner, as will be seen in an example which I give (fig. 40) from Mr. Roach Smith's Collectanea Antiqua. All these circumstances can leave no doubt in our minds of the intimate intercourse between the Franks and the Kentish Saxons.

To return then to Kent, and to the collection which is now before us,—as little as the subject has yet been really studied, it already begins to throw a considerable light on the condition of the Anglo-Saxons in England before the period of their conversion to Christianity; after which, only, we begin to know them from history. The Kentish graves, abounding in ornaments of gold and silver and other jewellery, and containing many articles indicating social refinement, shew a people who were rich and powerful, far more so than the other Anglo-Saxon states, where the precious metals are rarely found, and the gold ornaments are replaced by gilt bronze; and this explains to us the high position held by Kent towards the other states at the dawn of our Anglo-Saxon history. Cowrie shells, brought from the Indian ocean, money from Constantinople and from France, glass from the interior of Germany, all these prove an extensive commerce, the origin and accompaniment of national prosperity.

I need not say, after these considerations, that the study of the interesting objects now exhibited to you is one of national importance, and that the collection made by Bryan Faussett ought to be considered as, in the highest sense of the term, a national monument. I cannot therefore help sharing largely in the regret, felt by I believe every Englishman who has reflected on the subject, at the manner in which this collection has been rejected by the trustees of our great national museum, and for the sort of an excuse which was made for that rejection, when its propriety was questioned in the House of Commons. It was not only from being transferred to the Continent, or from passing into the hands of some other collector, that this collection was saved by the intelligent zeal of Mr. Mayer; for I have reasons to believe that Mr. Mayer actually stepped in between the British Museum and a public auction room, and that if he had not purchased them, the whole collection might now have been scattered in small lots, all over the world. I must add that we are about to receive from that gentleman a benefit for which we might probably have looked in

vain but for the chance which threw the collection into his hands. Mr. Mayer is already proceeding with the publication of the whole of the Faussett manuscripts, to be illustrated with engravings of the articles forming this collection, and he has wisely placed it under the editorial care of an antiquary whom I consider as the most capable of all our scholars to perform such a task effectually, Mr. Roach Smith. The study of Anglo-Saxon antiquities, and consequently the knowledge of the subject, are evidently extending themselves, and several works of great interest on particular cemeteries have been published by the zeal of individuals. I need only mention the "Fairford Graves," by Mr. Wylie, and the cemetery of Great Wilbraham, by Mr. Neville. I will take this opportunity, too, of calling attention particularly to the praiseworthy undertaking of one of our well-known antiquaries, Mr. Akerman, who is publishing in numbers, under the title of "Remains of Pagan Saxondom," a series of miscellaneous articles from cemeteries in different parts of the country, which is highly deserving of the encouragement I trust it has received, and will form a very useful collection of examples. But all these works sink in importance before Bryan Faussett's Journal of his Excavations. Whatever his antiquarian knowledge may have been, Faussett was a most careful observer and most faithful recorder of what he observed; and I can venture to announce that everybody who understands the subject will be astonished at the quantity of valuable facts which will be placed before the world by the publication of these manuscripts.

40. A Frankish Urn.

NOTE (to p. 9) ON THE USE OF BOWS AND ARROWS AMONG THE ANGLO-SAXONS.

In a paper in the 34th volume of the Archæologia, Mr. Akerman has stated the opinion that the bow was a despised implement among the Anglo-Saxons, and that they did not use it as a weapon of war; and as on other occasions he has since repeated this, as though it were an acknowledged fact, and the statement appears to a certain degree under the authority of the Society of Antiquaries, perhaps I may be permitted to offer a remark or two on the subject. In the first place I would observe, that I cannot understand any people despising or neglecting so formidable a weapon as the bow if they were acquainted with the use of it, and that it was well known to the Anglo-Saxons we can have no doubt, since our English names, *bow* and *arrow*, are words belonging to the Anglo-Saxon language; and the fact of these words having been preserved in the language shews that the use of the things they designate was derived from the Saxons and not from the Normans, otherwise we should doubtless have called them *arks* and *fletches*.

Mr. Akerman quotes the following lines from the celebrated Exeter Book, (p. 341, Thorpe's edit.) where they form part of a collection of gnomic verses—

scyld sceal cempan,	a shield for the soldier,
sceaft reafere,	a shaft for the robber,
sceal bryde beag.	a ring for the bride.

And he seems to imagine that this proves that the Saxons held the arrow in contempt, as a weapon only to be used by robbers. Mr. Akerman also gives from the same book several passages, illustrating as he supposes, the use of the Saxon *gar* as a javelin thrown by the hand. One of these, taken from a religious poem, (p. 42), runs as follows—

þon gar-getrum	when the gar shower
ofer scild-hreadan	over the shield's defence
sceotend sendaþ.	warriors send.

I will only remark on the first of these passages, that, although no doubt the bow was the best weapon for a robber, who naturally wished to kill his victim at a distance, yet it does not at all follow as an inference that it must be despised by other people. If we alter the words to make the sentiment applicable to modern times, and say, "a pistol for the highwayman," which would be equally true, should we be justified in inferring from this that the pistol is a weapon that Englishmen hold in contempt?

In the second of these extracts, Mr. Akerman has been led into an error by Mr. Thorpe's English translation. It is true enough that the Anglo-Saxon *sceotend* may be translated in general language a *warrior*, but it signified a warrior of a particular class; in fact it is the substantive of the word *sceotan*, to shoot, and is the Anglo-Saxon word for *an archer*. Moreover, Mr. Akerman has given us, somehow or other, a mutilated sentence, the remaining words of which would have gone far towards setting him right. The passage should have been read and translated thus:—

þonne gar-getrum	when the shower of shafts
ofer scild-hreadan	over the shield's defence
sceotend sendaþ	the archers send,
flacor flan-geweorc.	quivering arrow-work.

Indeed, I can hardly imagine anybody reading the poetry of the Exeter Book, even slightly, and leaving it with anything but the conviction that the people for whom it was composed were well acquainted with the use of bows and arrows. It must be remembered that the language of this poetry is often figurative, and in such language the images are naturally taken from objects with which people were most familiar. It is singular enough, that in the same gnomic poem from which Mr. Akerman takes the first of the foregoing extracts, and only a few lines further on, (p. 343), the poet, speaking of the natural fitness of things to each other, says—

boga sceal stræle,	a bow shall have an arrow.

Again, in a poem on the endowments of men, (p. 296), we are told that

sum biþ rynig,	one is a runner;
sum ryht scytte.	another a sure archer.

And a little further on we are informed that another

.... scyldes rond	.... the disc of a shield
fæste gefegan,	makes firmly,
wiŏ flyge gares.	against the arrow's flight.

I think there can be little doubt that these terms *quivering* or *flickering*, and *flying*, have reference to the feathers on the arrow. The idea found in other passages, of the arrows coming in *showers*, will be well understood as applied to a discharge of archery in a battle. The epithets in the following passage (from Exeter Book, p. 326) are expressive and peculiarly characteristic of an arrow's flight—

Ful oft of þam heape	full oft from that troop
hwinende fleag	whining flew
giellende gar	the yelling arrow
on grome þeode.	on the fierce nation.

Again, in the same religious poem from which Mr. Akerman gives the second illustration I have quoted from him, and only a little further on, (p. 47), we meet with the following passage:—

He his áras þonan	He his angels thence
halig of heahðum	holy from above
hider onsendeð,	will send hither,
þa ús gescildaþ	who shall shield us
wiŏ sceþþendra	against the enemies'
englum earhfarum;	noxious quivers;
þi læs unholdan	lest the fiends
wunde gewyrcen,	inflict a wound,
þonne wroht-bora	when the accuser
in folc Godes	among God's people
forð onsendeð,	sendeth forth
of his brægd-bogan	from his bended bow
biterne stræl;	the bitter arrow;
forþon we fæste sculon	therefore we should firmly
wiŏ þam fær-scyte, &c.	against that sudden shot, &c.

Here we have a distinct image of hostilities in which one party drawing their arrows (*gares*) from their quivers, (literally, arrow-cases) shoot them from bended bows into the midst of the other party—which in fact is exactly analogous to the passage immediately preceding, taken from a poem describing historical events (the song of the scop or minstrel). I will only give one other example—it is taken from the Legend of St. Guthlac, (p. 170), and is part of the description of the progress of a mortal disease—

com se seofeŏa dæg	The seventh day came
ældum andweard	present to mortals
þæs þe him ingesonc	since that into him penetrated
hat heortan neah	hot near the heart
hilde scurum	in battle showers, (*i.e. showers of arrows such as occur in a battle,*)
flacor flan-þracu	the quivering arrow's force.

Surely, with these extracts taken only out of one volume, nobody will tell us again that the Anglo-Saxons were not well acquainted with the use of bows and arrows in war. I have no doubt whatever that some of the smaller iron blades we find in Saxon graves are the heads of arrows—they are too small for javelins; but all doubt is quite set at rest by the recent researches of Mr. Hillier in the Anglo-Saxon cemetery in the Isle of Wight, where he has found not only unmistakeable arrow heads, but the remains of the bows. A bundle of arrow-heads, I believe about a dozen, was found in one grave opened by Faussett.

NOTE (to p. 25) ON THE ETHNOLOGY OF THE ANGLO-SAXONS.

The Anglo-Saxon historians have left us a very straight-forward account of the great ethnological divisions of their race, and as far as we have yet gone in this line of research the difference in the articles found in Anglo-Saxon cemeteries, in different parts of the island, correspond with it; but the exact geographical limits are not so easily fixed, and in fact, they no doubt varied at different periods. The limits of the Kentish Jutes are clearly defined, and the same may be said of the South Saxons, the Middle Saxons, and the East Saxons; and to some degree of the Northumbrian Angles. It would not, however, be so easy to fix the exact boundary line inland of the East Angles or of the Middle Angles of Lincolnshire; and the boundary of the Mercians was continually varying. It must be understood that I am speaking of the Mercians of the age previous to their conversion, of the history of which we are really ignorant. We learn from the Saxon Chronicle, that in the year 571, the west Saxons under Cuthwulf took from the Britons the towns of Bedcan-ford (Bedforda), Lygean-byrg (Lenbury), Ægeles-byrg (Aylesbury), Bænesing-tun (Benson), and Egonesham (Eynesham); that in 577, under Cuthwine and Ceawlin, they defeated the Britons at Deorham, and obtained possession of Bath, Cirencester, and Gloucester; that in 584 they defeated the Britons at Fethan-lea (Frethorne, on the Severn), and took "many towns;" and we know that they subsequently extended their conquests to the Wye. It is not till 628 that we find the Mercians invading the frontiers of the West Saxons, and fighting a battle with them at Cirencester. I think, therefore, that in treating of the pagan period we may consider the kingdom of Wessex as including the modern counties of Bedford, Buckingham, Oxford, and Gloucester, and perhaps also part of Worcestershire and Herefordshire, and that the population of those districts are really Saxon and not Angle. This is a consideration which must not be lost sight of in our classification of the early Anglo-Saxon remains; and it is upon it that I have given the limit between the west Saxons and the Mercians in the map of Saxon-England during the pagan period which accompanies this paper. The Mercians appear to have pushed forth from Lincolnshire in a western and south-western direction, and so to have reached the borders of Wales at a very early period, after which they began to extend their conquests towards the south.

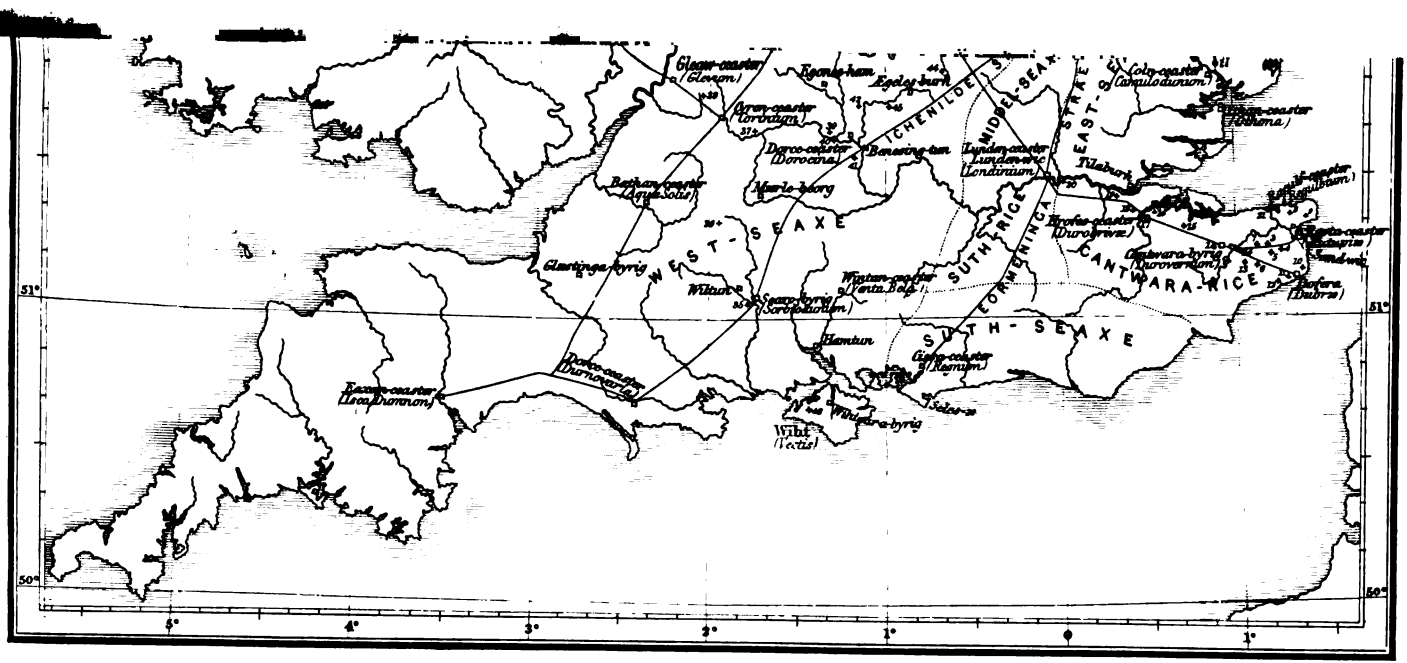
The distribution of the cemeteries, as marked by the small crosses in this map, is far from uninteresting; but the discoveries hitherto made have been in most cases so accidental, that it would be premature to draw any inferences from it. However, as I suspect the presence of these cemeteries marks generally the seat of what we might, perhaps, call the more aristocratic part of the race, that is, of those who were buried together with the greatest ceremony, their position has, to a certain degree, an historical importance. As far as we yet know, the mass of the great cemeteries of the Jutish race lay in east Kent, on the sea-coast from Hythe to Ramsgate, along the banks of the Thames; the cemeteries of the east Angles lay in and on the borders of Cambridgeshire; those of the Mercians especially in Leicestershire. It is rather a peculiarity of the Peak of Derbyshire that the Saxon barrows there are not found in cemeteries, but in single scattered tumuli, and that district may have been occupied by a peculiar tribe, or by a mining people, who, though not Saxons, adopted Saxon manners. They have been found rather in a similar way scattered over the Downs of Sussex. The discoveries in other parts of the country are as yet too few to allow us to form any judgment of the peculiarities in their position. The following is, as nearly as I have been able to make it, a complete list of the Anglo-Saxon cemeteries of the pagan period which have hitherto been discovered. The numbers refer to the map.

KENT.

1. Chartham Down.
2. Kingston Down.
3. Gilton, in the parish of Ash.
4. Coombe, in the parish of Wednesborough.
5. Sibertswold.
6. Barfreston Down.
7. Wingham.

KENT, *continued.*

8. Minster, in Thanet.
9. Osengell, in Thanet.
10. St. Margaret's, near Dover.
11. Between Folkestone and Dover.
12. Folkestone.
13. Barham.
14. Bourne Park.
15. Sittingbourne.


Glewm-ceaster (Glevum)
Tyrnleahum
Egelesburh
Cirencester (Corinium)
Ayrun-ceaster (Arbrigia)
Dorce-ceaster (Dorocina)
Benesing-ton
Lundenc-ceaster (Londinium)
Tilaburh
Bathan-ceaster (Aquæ Solis)
Merle-beorg
Ebrafus-ceaster (Durobrivæ)
Glastinga-byrig
WEST-SEAXE
Wintan-ceaster (Venta Belg.)
Wintan-ceaster
Sealesbyrig (Sorbiodunum)
SUÞRICE
SUÞEORNINGA
MIDDEL-SEAXE
EAST-SEAXE
CANTWARA-RICE
Hamtun
SUÞ-SEAXE
Cisseceaster (Regnum)
Dorce-ceaster (Durnovaria)
Exanc-ceaster (Isca Dumnon.)
Wihtgara-byrig
Wiht (Vectis)
Sæfern
51°
50°
5°
4°
3°
2°
1°
0
1°

J. Basire, sc.

KENT, *continued.*

16. Chatham Lines.
17. Rochester.
18. Strood.
19. Northfleet.
20. Greenwich.
21. Reculver.

EAST SAXONS.

22. Colchester.

EAST ANGLES.

23. Linton Heath, Cambridgeshire.
24. Great Wilbraham, Cambridgeshire.
25. Little Wilbraham, Cambridgeshire.
26. Stowe Heath, Suffolk.
27. Staunton, Suffolk.
28. Aldborough, Suffolk.
29. Tostock, near Ixworth, Suffolk.
30. Eye, Suffolk.
31. Near Bungay, Suffolk.
32. Near Swaffham, Norfolk.
33. Walsingham, Norfolk.
34. Markeshall, near Norwich.

WEST SAXONS.

35. Harnam, near Salisbury.
36. Roundway Down, near Devizes, Wilts.
37. Fairford, Gloucestershire.
38. ———, Gloucestershire.
39. Near Abingdon, Berkshire.
40. Long Wittenham, Berkshire.
41. Blewbury, Berkshire.
42. Cuddesden, Oxfordshire.
43. Souldern, Oxfordshire.
44. Mentmore, Buckinghamshire.
45. Dinton, Buckinghamshire.
46. Sandby, Bedfordshire.
47. Shefford, Bedfordshire.

ISLE OF WIGHT.

48. Chessell Down.
49. ———

MERCIA AND THE MIDDLE ANGLES.

50. Caenby, Lincolnshire.
51. Castle Bytham, Lincolnshire.
52. Near Newark, Lincolnshire.
53. Searby, near Caistor, Lincolnshire.
54. Syston Park, Lincolnshire.
55. Near Cottgrave, Nottinghamshire.
56. Kingston, near Derby.
57. Winster, in the Peak.
58. Middleton Moor, Peak.
59. Haddon field.
60. Brassington, Peak.
61. Standlow, near Dovedale.
62. Cowlow, near Buxton.
63. Ingarsby, Leicestershire.
64. Great Wigston, Leicestershire.
65. Queenborough field, Leicestershire.
66. Rothley Temple, Leicestershire.
67. Billesdon Coplow, Leicestershire.
68. Husband's Bosworth, Leicestershire.
69. Parish of St. Nicholas, Warwick.
70. Near Warwick.
71. Cestersover, near Rugby, Warwickshire.
72. Churchover, Warwickshire.
73. Marston Hill, Northamptonshire.
74. Badby, Northamptonshire.
75. Hunsbury Hill, Northamptonshire.
76. Barrow Furlong, Northamptonshire.
77. Welford, Northamptonshire.

THE ANGLES NORTH OF THE HUMBER.

78. South Cave, Yorkshire.
79. Great Driffield, Yorkshire.
80. Near Rudstone, Yorkshire.
81. Castle Eden, Durham.

The Manufacture of Cobalt.

By Henry Atherton, Esq.

(Read February 15th, 1855.)

The preparation of Cobalt and its Oxides, has always possessed a considerable degree of interest for those engaged in the study of Chemistry: greater perhaps than its relative importance to other branches of manufacturing industry would appear to warrant. This perhaps is in part owing to the difficulty which has always been experienced in obtaining correct information, from the limited number of persons practically engaged in the manufacture, by which a subject, in itself really very simple, has been wrapped up in a kind of mysterious secrecy; and partly also, perhaps, from exaggerated ideas of the scarcity of cobalt ores, and the value of the products derived from them. Believing that an authentic account of the process by which cobalt and zaffer blues have been prepared for the use of the earthenware manufacturers may not prove unacceptable, I have been induced to attempt to describe it; and however trifling may be the actual value of the information which I can communicate, it may at least be relied on, as being derived from a practical knowledge of the business in which I myself, as well as my late father, have been engaged at Sutton Heath, near St. Helens, during the last thirty years.

I need scarcely observe, that the metals which I shall frequently have occasion to mention, namely, cobalt and nickel, were from their apparent worthlessness and intractability, objects of dislike and even dread to the earlier miners and metallurgists, who applied to them the names of some among those goblins with whom the German imagination, ever keenly alive to the supernatural, peopled the dark recesses of their mines. Cobold still figures as a malicious fiend in the legends of the Hartz mountains, and Pelz Nickel is I believe, a kind of Puck, or Robin Goodfellow, rather mischievous than really malevolent, in the German nursery tales. The application of cobalt to the arts dates from a much earlier period than that of nickel, which has only been sought after and become valuable since the introduction of the so-called German silver, of which it forms the principal and characteristic ingredient.

Cobalt is extensively employed in two distinct branches of manufacture. One application, and perhaps its most important, is to the purpose of making smalts, a well known article, consisting of glass coloured blue by cobalt or its oxides, finely ground, and extensively used in the paper and linen manufacture. The other is to the purpose of printing and painting blue on china and earthenware. Into the former of those processes it is not my province to enter, and I shall therefore confine my observations to the latter, with which alone I am practically conversant.

Three descriptions of ores are recognised by cobalt refiners in England. One called cobalt ore, obtained for the most part in Sweden and Norway, has usually been freed abroad from a considerable portion of its stony matrix by washing, but has not undergone any further preparation. It occurs of various strength or richness, and being mineralized for the most part with large portions of arsenic and sometimes sulphur, requires to be roasted previous to its reduction. Another description of ore called "zaffer," may be considered as being already in some degree a manufactured article. It is imported from Saxony, in casks containing each one centner or Saxon cwt., of various qualities, each distinguished by its appropriate mark and letter. The quality known as FFS is that most frequently employed by the refiners. It is in the form of a fine powder, has been subjected to preliminary roasting, and is professed to contain a uniform per centage of cobalt. The third division consists of ores imported in the precise condition in which they are dug out of the earth. Cobalt has been found in Sweden and Norway, in Saxony, Hungary, Bohemia, and many other of the so-called German States, in the Asturias in Spain, in Cornwall, and more recently in various parts of America. The Saxon, Swedish and Norwegian are however those most frequently employed by blue refiners, and as a general rule it may be stated, that the Saxon zaffers contain cobalt, iron, arsenic, nickel, and bismuth; and the Swedish and Norwegian cobalt, iron, arsenic, and copper, but without bismuth. In consequence of the extreme difficulty of perfectly separating cobalt and nickel, and presenting the former in an entirely isolated form, the colour prepared from ores in which the latter metal was not present was usually superior to that made from those which originally contained it, and hence the distinction, even yet, under a greatly improved process, very difficult to eradicate from the minds of the earthenware manufacturers between what are termed cobalt

and zaffer blue. Both are however the same article, but the pure oxides are usually termed cobalt, and when fluxed by the refiner previous to sale, that is, vitrified with a certain portion of flint and other materials to diminish their strength and present them for consumption in a cheaper form, they are usually, but without reason, called zaffer blues.

The processes employed for the refining of zaffer and cobalt ores being in most respects similar, I will adopt the former as the basis of my description, and notice incidentally those points in which they vary.

The first process is to reduce the ores to a metallic form, or as it is technically termed, to "run them down." This is performed in a reverberatory furnace called the "running down kiln." That which I have employed for many years is twelve feet long, eight feet wide, and five feet high to the centre of the arch. It is heated by five mouths or fire places, has two chimneys, and is capable of running down from fifteen cwt. to a ton of ore. Pearl ashes and wood charcoal are still I believe used by many refiners in Staffordshire for the purpose of reduction, but for some years past I have advantageously substituted soda ash and pulverized pit coal. These materials are not only cheaper, but the reduction is more perfect, and the produce, especially of bismuth, larger than under the old system. The mixture which I now employ is as follows :—

Three casks of zaffers, each containing a Saxon centner, is the quantity usually mixed at once. They are emptied into a wooden trough called the mixing frame. To these are added, 132 lbs. of soda ash, containing forty-eight per cent. of alkali, 54 lbs. of pulverized pit coal, and 100 lbs. or 120 lbs., or thereabouts, according to the quantity on hand of what is termed "bottling scoria," from former workings, and which will be hereinafter described. The whole is well mixed with spades, and filled into crucibles of unbaked fire clay, sixteen inches high and eight wide. Fifteen casks are usually run down at once, and will fill from 90 to 100 such crucibles. These are placed in close juxtaposition on the floor of the running down kiln, and slightly bedded in sand. The fires are lighted about six o'clock in the evening, the mouths again filled up with slack or small coal about midnight, and allowed to burn slowly all night. This is to dissipate any moisture contained in the materials, which might cause the crucibles to split and run out. About six o'clock the next morning the mouths are again filled up with coal, or rekindled if extinguished, and the heat is

progressively and steadily increased for six or seven hours, until it reaches a bright red. A strong ebullition may be heard, by applying the ear to a hole left for the purpose of observation in the "clammings", or bricks with which the door of the kiln is walled up. Brilliant spires of white fire rise from the crucibles, and during the whole process there is a considerable disengagement of arsenic. When the ebullition has ceased, the fires are raised to the highest possible pitch, and kept at a brilliant white heat for eight or ten hours. The operation is usually complete by about eight or nine o'clock the same evening, though two or three hours longer are occasionally required. The mouths are then heaped up with cinders and the fires allowed to go out.

Should the operation have succeeded, the scoria, on breaking the crucibles will be found black, perfectly vitreous, and entirely free from unconsumed carbon, or small fragments of metal, which from their globular form are usually termed "shot." At the bottom of the crucible is found a cake or regulus, the lower portion of which consists of bismuth, adhering to, but perfectly distinct from the upper, which consists of a mixture of cobalt, iron, nickel, and arsenic. The pieces of metal are then placed on an iron plate heated to redness. The bismuth, which fuses at a low temperature, melts off, and is run into ingots for sale. A small quantity of powdered nitre sprinkled on the pieces of metal, is found to facilitate the separation of the last portion of bismuth, which, as it is well known, will not unite by fusion with the other metals contained in the ore.

The pieces of metal when cold, are reduced to powder. This is effected in cast iron mortars, sixteen inches high, and seventeen inches wide. The pestles, which weigh about one cwt. each, are fixed in a frame and lifted by a small steam engine. The produce is usually about 10 lbs. per cask of bismuth, and 33 lbs. to 36 lbs. of cobalt, nickel, and iron. The scoria which is surcharged with iron, is thrown away. When the ore run down does not contain bismuth, the product is a homogeneous regulus of cobalt, iron, arsenic and copper, or nickel, as the case may be.

Should the operation, however, appear to have been imperfectly performed, which sometimes, though rarely happens, and which is known by the scoria containing unconsumed carbon, or small globules of metal called "shot," it is again run down with the addition of a pound or two of pit coal, and 12 oz. of white arsenic to every 12 lbs. of scoria; when any metal

that it may contain will generally be found separated, and is mixed with the former produce.

The next process, termed "bottling," is intended to separate the iron, and is founded on the greater affinity of that metal for oxygen, and the facility with which it enters into vitreous combination compared with either cobalt or nickel.

To every 32 lbs. of the before-mentioned pulverized, running down produce are added, 6 lbs. of finely ground pearl ash, and 4 lbs. of sand. These are intimately mixed in a brass or copper pan, and filled into crucibles of unbaked clay, exactly similar to a preserving pot, the mouth being contracted to prevent too great a dissipation of the arsenic, a certain portion of which it is desirable to retain, to promote ebullition in a later stage of the process. These are technically termed "bottles," and contain about a pint and a half each. They are placed in a bed of sand in another reverberatory furnace similar to that employed for running down, but of smaller dimensions, called a "bottling kiln."

The fires are lighted about six o'clock in the morning, and the heat very gradually raised to whiteness, and continued at that point for about four hours. The operation usually lasts until about five or six o'clock in the evening, when the fires are suffered to go out.

On breaking the crucibles, the metal will be found in a lump at the bottom of each, beneath a cake of dark greenish black scoria, from an inch and a half to two inches in thickness. The scoria from this operation, which is quite surcharged with iron is thrown away, the metal pounded, and again subjected to a similar treatment with a fresh portion of sand and ashes. At every subsequent operation a further portion of iron is separated by oxidation and vitrification, but the scoria which now begins to take up a portion of cobalt is preserved, pounded, and put into the next running down, by which the cobalt which it contains is recovered, for as iron is more readily scorified than cobalt, on account of its greater affinity for oxygen, so cobalt is more easily reduced to the metallic form by the action of carbon, and is the first to descend.

The operation which I have just described is repeated an indefinite number of times, depending upon the quantity of iron originally contained in the ore. The FFS zaffers of Saxony are usually sufficiently refined in

three or four bottlings, but those from Norway, and many cobalt ores, require the process to be repeated seven, eight, or even nine times. At each successive operation, the appearance of the scoria, and the "stain" as it is called, on the sides of the crucibles, improves, till at length, when the latter becomes a bright blue, and a portion of the scoria when crushed exhibits the appearance of smalt, the iron is judged to be extracted, and the metal, which consists of a mixture of cobalt, nickel or copper, and arsenic is pounded, and passed through a brass sieve. It is now ready for the last operation called "calking," by which the nickel or copper is separated, and the cobalt oxidated, fluxed, and completed for sale. The produce will now be found to have diminished to about 28 or 29 lbs. per cask.

The separation of cobalt from nickel, has always been considered difficult, and in fact until within a comparatively recent period, the means adopted for that purpose on the large scale have been very imperfect, and the metals were very far from being absolutely free from intermixture. The earliest method used in Staffordshire was what was termed the "honeycomb process," from the cobalt remaining behind in a semi-porous or spongy form. It consisted in melting down the mixed metals with a proportion of sulphur and arsenic. The pieces of metal were then placed in a furnace, in a strong but well regulated heat. The sulphuret of nickel was the first to liquefy and trickle down from the mass, leaving the sulphuret of cobalt unmelted, but partly calcined. It was afterwards pulverized, roasted to free it from sulphur, and again roasted in combination with calcined flint and other fluxes. This process, which was very imperfect, was subsequently abandoned for that which I am about to describe. I have never seen it performed, nor can I say at what period it ceased to be employed, but I have reason to believe that it was practised in the potteries as recently as 1786, and may perhaps have been continued still later. The more modern practice is as follows:—

This last process is termed "calking" or calcination. The object is to separate the cobalt from the nickel, or copper with which it is combined. For this purpose, 90 lbs. of refined or "bottled" metal are intimately mixed with the following or some such similar flux, that is to say, to every 30 lbs. of metal, which is the quantity mixed at once, are added 3 lbs. calcined flint, 1 lb. red lead, 2 lbs. 12 oz. calcined gypsum or sulp. of lime, 2 lbs.

12 oz. sulphate of barytes, 8 oz. boracic acid, 8 oz. soda ash, 4 oz. nitre, and 3 lbs. of chippings, composed of small fragments of calx with portions of crucible adhering to them, produced in former operations. This quantity will about consume all that are produced.

Great stress is laid by various refiners on the flux employed in calking, each conceiving himself to be in possession of a superior mixture, but I am inclined to think that there is in reality much less difference than is usually supposed. I have altered and modified the various mixtures used for this purpose, without very materially affecting the result. The chief requisite is that the flux should be moderately soft, or melt at a comparatively low temperature, and that it should be composed of substances which by parting with the volatile portion of their constituents are disposed to ebullition, without which only a small portion of calx will be obtained, because if the mixture remain quiescent when melted, the absorption of oxygen and consequent vitrification is confined merely to the surface. The retention of a portion of arsenic in the metals, conduces strongly to this ebullition, and is therefore very desirable. I have in my possession a number of these fluxes employed at various times by myself and other manufacturers, but need not detain you by reading them.

The mixture of flux and metal, is filled into small flat crucibles made of the usual biscuit mixture of flint and pipe clay, and technically called "calking cups." Each contains about a pound and a half of metal with its flux in proportion. These are then placed on stands to receive the contents in case of accident, and fired in a furnace termed the "calking kiln," similar in construction to the bottling, and running down kilns, but of still smaller dimensions. The cups and stands differ from the crucibles hitherto employed not only in being composed of superior clay, but also in being fired or baked before use. The fires are lighted about four o'clock in the morning, and the heat very gradually increased. About noon, when the mixture has been for some time at a red heat, it may be perceived beginning to liquefy, and at this stage particular attention is requisite to prevent it from boiling over. In about an hour, it will have melted down and subsided. The fires are now pushed vigorously, and the furnace mouths filled up with fresh coal about every forty minutes. The heat is raised to the highest possible pitch by continually pricking the bars to keep them free from clinkers, or vitrified cinders, and the

mixture is kept boiling for six or seven hours, or until some of the cups are observed to become eaten through, and run out into the stands. The mouths are then covered with cinders, and the kiln allowed to cool. The progress is observed by occasionally withdrawing a small clay stoppel from a hole left in the "clammings," and a small piece of green glass, fixed in a board, is employed for the protection of the sight.

The rationale of this process is precisely similar to that of the last. The affinity of cobalt for oxygen is greater than that of nickel, and the former metal is therefore the first to vitrify in combination with the fluxes. Should the heat be too long continued the nickel would begin to be oxidated, and pass into the calx, and indeed under any circumstances a certain portion of the latter metal is taken up. The cups when cold are broken. On the surface is found a cake of vitrified cobalt and flux, varying from an inch to two inches in thickness, beneath which lies the nickel in a metallic form. The calx is then carefully chipped away from the cups to which it usually adheres very strongly; and should it be suspected that the whole of the cobalt has not been extracted from the nickel, the latter is again pounded and subjected to a second calcination, with a smaller portion of flux, but the heat is not continued so long. The blue obtained is called "seconds," and is of inferior quality, being not only weaker than that first obtained, but also containing a portion of nickel which is very detrimental to the tint. The calx is pounded, passed through a moderately fine sieve, and is then ready for sale to the earthenware manufacturers. The produce with these materials will generally be from 33 to 35 lbs. per cask, and is worth from 5s. 6d. to 6s. per lb. The nickel which averages from 8 to 10 lbs. per cask, is sold to the manufacturers of German silver.

If the ore contained copper instead of nickel, the cake found beneath the vitrified calx will consist of that metal, but rendered white and brittle by its admixture with arsenic. In the latter case the blue will be of superior quality, copper being not only less liable to oxidation than nickel, but the slight green tinge which it communicates to the blue disappearing at a moderate heat.

The black oxide is obtained by the following process:—Twelve pounds of the above calx are mixed with 8 lbs. of soda ash, 4 lbs. of charcoal or pit coal, and 1¾ lbs. of arsenic, placed in a crucible, and run down with a

long continued and strong heat. The cobalt is thus again reduced to the metallic form, and if any iron be contained in the calx, it is left behind in the scoria. The metal finely pulverized is spread thinly on dishes, and roasted two or three times at a low red heat. By this operation, it usually gains 25 to 30 per cent.

Such is the process by which, until within a few years, all the blues used in the earthenware manufacture were prepared. It has been my sole occupation; and I have every reason to believe it is now for the first time made public. It is however, now already becoming obsolete, and will probably be in the end entirely abandoned for one practised extensively in Birmingham, by the refiners of nickel for the manufacture of German silver. I shall conclude by a very brief sketch of the process by which this purification is effected. It may be found described in the passage which I am about to quote from Leopold Gmelin's "Hand Book of Chemistry," and which, if it be not an exact transcript of the process adopted, at least approximates very nearly to it.

The Hungarian speiss, containing 6 per cent. of nickel, and 3 per cent. of cobalt, is first fused with chalk and fluor spar, the slag thrown away, and the fused product ground to powder, and roasted in a reverberatory furnace till no more fumes of arsenic are given off. The roasted product then dissolves almost completely in hydrochloric acid. The solution is diluted with water, mixed with chloride of lime to convert the iron into sesqui oxide, and with milk of lime to precipitate that oxide together with the arsenic. The precipitate which is of no further use is then washed, and sulphuretted hydrogen passed through the clear liquid until a filtered sample gives a black precipitate on the addition of ammonia. The precipitated sulphates which are likewise of no further use having been washed with water, the solution is next heated with chloride of lime to precipitate the cobalt, and then with milk of lime to throw down the nickel. The cobalt precipitate is converted either into sesqui oxide by gentle ignition, or into protoxide by strong ignition, and sold in one of those forms. The precipitated nickel is reduced by charcoal, and sold to the manufacturers of German silver.

It is a curious circumstance, and one which I cannot help mentioning in connection with this subject, that the first application of cobalt to the purpose of printing blue upon earthenware, was made in Liverpool. The

ware was sent down from Staffordshire in what is called the biscuit or unglazed state, and after having been printed, glazed, and fired, was returned to the manufacturers in the potteries. The curious in topography, may perhaps feel some interest in visiting the spot, which is up a gateway on Shaw's Brow, and not probably two hundred yards distant from where we are at present assembled.

I cannot but regret my inability to enter into more scientific details. My intention has been merely indeed to afford you a faithful record of a process, which as I before observed has never previously been published, and which on that account, and the circumstance of being eminently a practical one, may not be devoid of a certain amount of interest. Even though abandoned, as it probably will be at no distant period for the acid process of which I have given you a slight sketch, it may not be uninteresting to trace the progress of the manufacture through its earlier and ruder stages. We are the better enabled to appreciate excellence by a review of the slow and frequently toilsome process by which excellence in science or art has been obtained, as the traveller who climbs the mountain to admire an extensive and beautiful landscape, enhances his pleasure by turning round to review the steep and laborious ascent by which he has gained its summit.

Cowley, and the Poets of the Seventeenth Century.

By David Buxton, Esq.

(Read December 14th, 1854.)

I may be somewhat singular in my opinion, and in any other place than the calm arena of literary research it might provoke a war of words as hot as was the strife of swords between Cavalier and Roundhead, but I do hold, most sincerely and firmly, that few brighter days ever dawned for English literature than that which was so soon and sadly overcast by the troubles of the "Great Rebellion."

The two periods which are generally regarded as the most illustrious in our literary history are the reigns of Elizabeth and Anne—the latter half of the sixteenth and the earlier portion of the eighteenth centuries. My

vocation to night is to vindicate the seventeenth. That, in some particulars, the Elizabethan age is entitled to a pre-eminence over it, I am as willing to admit, as I am prepared to deny the superiority of the other, later, period. In many respects the seventeenth century stands second to none, notwithstanding the disturbing causes of political strife, and social convulsion, which were so long and so fatally at work. Who will venture to place in any inferior rank, an age which counts among its worthies such men as Usher, and Laud, and Jeremy Taylor; Bishops Bull, Hall, and Bedell; Hammond, Isaac Barrow, Prideaux, Chillingworth, Fuller, Hales of Eton, Selden, Sir Thomas Browne, Sir Kenelm Digby, Izaak Walton, John Evelyn, Lord Clarendon, and Sir Matthew Hale; and then, in the particular province of our present enquiry, Milton, Cowley, Dryden, Waller, Denham, Wither, Crashaw, Herrick, and the author of "Hudibras?" Cowley himself has remarked that "a warlike, various, and tragical age is best to write *of*, but worst to write *in*."* Of the vast number of writers, whose names have come down to our own days, the circumstances of those unhappy times must have repressed and stunted the genius of many among them, diverted to different pursuits the talents of others, and harassed and embittered the lives of almost all. But if the early promise of King Charles' reign could have been fulfilled, there is little doubt that it would have been illustrated, in every department, by genius as gifted, and works as imperishable, as the happier reign of Elizabeth can boast.†

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* *Preface to Works*, p. iv.

† "The accession of Charles the First," says a writer, to whom no suspicion of partiality can attach, "seemed an auspicious event for the cause of literature and the arts. The Sovereign himself was a prince of much learning, and of a refined and elevated taste. To him this nation is indebted for the acquisition of the Cartoons of Raphael; he invited Vandyke, Rubens, Bernini, and other foreign artists to this country; was the liberal patron of Ben Jonson, Inigo Jones, and other native poets and artists; and amongst the crimes with which he was charged by his enemies was one which, at the present day, we cannot judge to be quite unpardonable, namely, that the volumes of Shakspeare were his companions day and night. The poets who flourished in his reign, in addition to those who survived the reigns of his predecessors, although they possessed not the commanding genius, and the wonderful creative powers of the Bards of the Elizabethan age, for there were giants on the earth in those days, were yet among the most polished and elegant writers which the nation has produced. The sweetness of their versification was not of that tame and cloying nature which the imitators of Pope afterwards introduced into our literature—smooth to the exclusion of every bold and original thought. * * * * The favourite amusement of this period was the dramatic entertainments called masques." Of those produced at Court, "Ben Jonson commonly wrote the poetry, Lawes composed the music, and Inigo Jones designed the decorations. Had Charles long continued to sway the English sceptre there is no doubt that literature and the arts, but especially the latter, would have been materially advanced."—*Neele's Lectures on English Poetry*, pp. 16–18.

It is a curious and very noticeable historical fact, that ever since the revival of learning, our literary history has exhibited a constant succession of alternations—first eminence, then mediocrity—first brightness, and then gloom.

"When sun is set, the little stars do shine."

The most striking proof of this is seen in the contrast between the successive reigns of Elizabeth and James—of Anne, and the first two Georges. As in mining, when you have worked out one rich lode, you must dig through a mass of rubbish before you can find another remunerative vein: as the coldness and sterility of Winter ever follow the sunny glow of Summer, and the glad luxuriance of Autumn; and these must be endured ere the hopefulness and cheering of another Spring can revisit us: and as a night of darkness separates the dying day from the approaching morrow, so is it in our literary history. And yet another illustration occurs to me, which, for its aptness, I hope may be excused. The distance between any two of those epochs which we delight to dwell upon, and the interval of common-place which divides them, remind me of the great squares of the metropolis. Go through that in which our own noble president resides, and which gives a colloquial designation to the district. The dwellings are palaces, and their inhabitants are the rulers of the land. Further on is another square of the same class. The backs of the houses of each meet, and together form a line of—stables, called locally a mews. And you can no more pass from one bright period of literary glory to another, without that dreary inter-space of mediocrity, than you can get from Belgrave-square to Eaton, without making that unpoetical passage of the stables. The reign of James I. was one of these intervals. It had little or no poetic excellence properly its own. All the brightness which adorned those times was either the twilight of the day which had made glorious the reign of Elizabeth, or the coming dawn of that which was to break in social storm and political convulsion afterwards. Not forgetting the names of Donne, and Sir Henry Wotton, and Bishop Henry King, it may justly be said that the characteristic of that epoch was mediocrity; and that, in comparison with the one which followed it, and still more with that which preceded it, it shrinks into littleness and insignificance.

Of all the poets of the Caroline era, Cowley was unquestionably the most

popular, and—Milton alone excepted—he was the best and most highly gifted amongst them. Milton's own wish for himself was that he might "fit audience find, though few;" but his contemporary was more fortunate than even this: he had the applause of congenial minds, but not of these alone. To the commendation of the critic was added the admiration of the multitude. Dr. Johnson says, "He was in his own time considered as of unrivalled excellence." Clarendon represents him as having taken a flight beyond all that went before him; and Milton is said to have declared that "the three greatest English poets were Spenser, Shakspeare, and Cowley."* Wordsworth mentions, in proof of his popularity, that his own folio copy of Cowley's works is the seventh edition, dated 1681.† This was only fourteen years after the poet's death. In 1693 another folio edition was published, a copy of which is before you; and Mr. Craik also mentions that a twelfth edition was issued by Tonson, in 1721, of the collection made by Cowley himself.‡ On his decease, King Charles declared that he "had not left a better man behind him in England."‖ Sir John Denham penned an elegy, on his interment in Westminster Abbey, and Bishop Sprat wrote his life—the same which is prefixed to his works, and which has furnished the materials for every subsequent biography. But his popularity did not last long. Other great and living names arose, before which that of the departed Cowley might well grow dim. In the year of his death, "Paradise Lost" appeared—the work which its author had contemplated in his early manhood as that "something" which he should leave "to after times," "so written" "as that they should not willingly let it die."§ In the same year Dryden published his *Annus Mirabilis*, and thence we may date that public life of the author of "Absalom and Achitophel," in which, like his own Zimri, he was

"Everything by turns, and nothing long;"

pouring forth the odes of the laureate, the licentious plays of the popular dramatist, the stinging satires of the partisan and polemic, and the more polished works of the ripe scholar, with a profusion, and a general, though not unexceptionable, excellence, which make his life an epoch in

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* Johnson's Lives of the Poets, vol. i.—Cowley.
† Essay Supplementary to the Preface to his Works.
‡ Literature and Learning in England.
‖ Life, by Bishop Sprat. § Against Prelacy, A.D. 1642.

our history. He, with other far inferior writers, who, aiming to be popular, ceased to be pure, and whose petty productions rank as low when tried by the canons of criticism as by the laws of morality, now received the popular applause which had once been awarded to Cowley; and thus it happened that in the very next generation Pope could ask:

> "Who now reads Cowley? If he pleases yet,
> His moral pleases, not his pointed wit:
> Forgot his epic, nay, Pindaric art,
> But still I love the language of his heart."

Thus neglected, he passed away from public notice. Few persons read him: the popular impression was traditional, and it imputed to him the ingenious concatenation of dry conceits, uninspired by warmth of feeling, or gaiety of fancy, and unadorned by any considerable graces of language or versification. Dr. Johnson greatly strengthened this error by appending his notice of the metaphysical poetry to the life of Cowley, and illustrating it copiously from his works. I do not dispute the propriety of placing him amongst these writers, but I do claim for him poetical merits infinitely superior to any which he has in common with them. That he had faults is undeniable: his style was modish and involved; his diction both careless and artificial, loaded with conceits, strained indeed, and yet feeble. But these were the faults of the age he lived in, and of the fashion which he too readily followed. While they appear as blemishes upon his merits, they do not eclipse them, and those merits were all his own. Pope, in the quotation just made, expresses love for the "language of his heart." Neele says, "His very faults are the offspring of genius; they are the exuberances of a mind 'o'er-informed with meaning;' the excrescences of a tree, whose waste foliage, if properly pruned and arranged, would form an immortal wreath on the brows of any humbler genius."* A lover of nature, such as *Comus* alone sufficiently shows Milton to have been, could not but prefer Cowley to Dryden: we therefore find that Cowley was one of his favourite authors; but of Dryden he said: "he was a good rhymist, but no poet."†

The great authority on the other side is Dr. Johnson, whose judgment later writers have too commonly adopted without enquiry, and repeated with mischievous assiduity. It may seem presumptuous to impeach such

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* Lectures on English Poetry, pp. 66, 67.
† Johnson's Life of Milton.

an authority, but I do hold it as incontrovertible, that no critic of English poetry ever injured it by false criticism, and the enunciation of unsound principles, to the extent that Johnson did. The late Professor Wilson,* and the author of the "Christian Year,"† have each exposed the erroneousness of his views regarding sacred poetry, as set forth in his "*Life of Waller.*" Mine, though perhaps a bold, is still an humbler task. Without entering now into any theory upon the subject, it will, I think, be admitted that among the chief qualifications of a poet, must be reckoned quickness of perception, tenderness of feeling, a passionate love of nature, and a close and intimate sympathy with those warm affections which spring out "of the depth and not the tumult of the soul." Then, if these are the necessary qualifications of the poet, so are they of the competent judge of poetry; for notwithstanding the celebrated *dictum*, which tells us that a man may be a sufficient judge of a well-made table though he cannot make a table himself, still it is a simple truism to assert, that he who is deficient in certain mental faculties must be incapable of forming a sound judgment upon that which involves the exercise of those faculties. And that is true of Johnson which he wrote of another: "That with all his variety of excellence he is not often pathetic; and had so little sensibility of the power of effusions purely natural, that he did not esteem them in others. Simplicity," he adds, speaking of Dryden, "gave him no pleasure; and for the first part of his life he looked upon Otway with contempt, though at last, indeed very late, he confessed that in his play 'there was nature, which is the chief beauty.'" *(Life of Dryden.)* But it was not the beauty of nature which *he* admired. His whole life shows that the objects of his admiration were the artificial, and the artificial alone. Books and men, as they constitute the almost mechanical routine of city life, were his fields of observation; and his views of nature were practically limited, and that by choice, to the Temple Gardens and the civic Thames. He was a man, who, while he sought to *know* everything, had so little desire to *see* everything, that he regarded with contempt the universal opinion of the advantages of travelling. His "*Journey to the Western Islands*" is the work of a scholar—not of a poet. Wordsworth visited some of the same scenes sixty years later, and nothing can more strikingly illustrate the distinction

* Recreations of Christopher North. Vol. ii.
† Quarterly Review, vol. xxxii, 1825. See *Life of Dr. Arnold*, vol. 1, p. 73.

I have just made, than a comparison between Wordsworth's verse and Johnson's prose, written on the same subjects. His further description of Dryden is also true of himself: "The power that predominated in his intellectual operations was rather strong reason than quick sensibility. Upon all occasions that were presented, he studied rather than felt, and produced sentiments not such as nature enforces, but meditation supplies. With the simple and elemental passions, as they spring separate in the mind, he seems not much acquainted; and seldom describes them but as they are complicated by the various relations of society, and confused in the tumults and agitations of life." The poetry which he found in possession of the popular approval was the Didactic—often mere moralizing in verse—a style of composition which as it is nearest akin to prose, both in its subjects and its mode of treatment, must necessarily be of an inferior order of poetry. We know what works were read in Johnson's time—at least we know their names, if little else. They were Pomfret's "*Choice*;" Phillips' "*Splendid Shilling*;" the same author's poem on "*Cider*;" Dyer's "*Fleece*;" Somerville's "*Chase*;" and the "*Creation*" of "that portentous bore, Sir Richard Blackmore," as Mr. Macaulay styles him.* I think no other evidence is needed to indicate what was the character of the popular poetry of that day: but if more should be requisite, it is very easily produced. The last great work of Johnson's life was to write the "Lives of the Poets:" on the title page they are styled "the *most eminent* English Poets." Now who were they? And by what standard was this eminence measured? The booksellers made the selection, leaving a limited discretion to the editor, which he did not omit to exercise. The list of names shows that the publishers understood poetic eminence only in the commercial sense; and, as if the selection which they made upon this principle was not sufficiently absurd in itself, Johnson exercised his own discretion by making it worse. The names of Pomfret and Watts, Blackmore and Yalden, were added by his special recommendation. He wrote a biography of each of the writers whose works I just now mentioned, and sent forth to the world a list of the "most eminent English Poets," which included, besides the authors already named, some others, of whose original compositions not a single line survives, while it excluded Spenser and Shakspeare, and every other illustrious writer from Chaucer, until

* Essays. Boswell's Johnson, vol. 1 p. 186.

Cowley appeared. Nor is this all. When a better feeling began to awaken, he treated it with such contempt as, for a time, withered it. But though, like the first wave of the tide, it retreated, and seemed to be lost, it soon came back again with increased force, and at length bore down the barriers upon which it had at first so vainly broken. Speaking of the "*Reliques of Ancient English Poetry*," to which I am now alluding, Wordsworth has placed it on record how much Germany is indebted to that work, while "for our own country," he adds, "its poetry has been absolutely redeemed by it."* Yet Johnson saw no merit in this book; he treated it with burlesque and ridicule. So that not only by his support and sanction to the vicious style in vogue, but by his disparagement of that which so worthily succeeded it, the fact is shown that the influence of Johnson upon English poetry was an injurious influence. The hidden charms and beauties which abound in natural poetry, as in the common things of nature itself; the simple diction appropriate to simple things which are when "unadorned adorned the most;" the sweetness of a common strain; the picturesque effect produced by the happy use of significant, though ordinary words; the involuntary grace which pertains to simple, natural, thoughts, as it does to the spontaneous movements and postures of children: these had no charms for that critic who, in reviewing *Comus*, found more to censure than to praise—who saw little to commend in the "Allegro," and the "Penseroso;" and nothing at all either in "Lycidas," or those sonnets which Wordsworth calls—

"Soul-animating strains—alas, too few."

Speaking of Lycidas he said, "Where there is leisure for fiction there is little grief." And yet the man who wrote this—a son remarkable for his filial attachment—penned his own fiction of *Rasselas* to defray the funeral expenses of his widowed mother. If it were not both very possible and very easy to distinguish between respect for a man, and submission to his authority in a matter of literary taste, I should not have said so much upon this subject. The character of Dr. Johnson appears to me to be such a striking embodiment of our national character, in its apparently anomalous combination of strength and weakness, greatness and littleness, that it seems as natural for an Englishman to sympathise with his failings, as to

* Preface to Supplementary Works.

admire his noble qualities. I have stood, many a time and oft, upon that spot in Poet's Corner which is made more sacred by his dust, beneath the shadow of Shakspeare's monument, and Addison's, and of that simpler tablet upon which is recorded his own famous epitaph of Goldsmith, and I have looked down upon his grave with as much pride and admiration, and with as deep a conviction of the great good which was wrought by his example and influence, as were ever felt, either in his own time or since: but in this matter of poetical criticism I hold him to be wrong, not only actually but necessarily. A man who could not endure to be out of London; who talked about the "silver flood" of the Thames at Greenwich;* who said "that when a man was tired of London he was tired of life;" who assented to and approved the sentiment that the spreading park "girt with the solemn majesty of trees," was not equal to Fleet street; and one of whose reasons for refusing to apply for Holy Orders (it must in justice be remembered that it was not the only one, or the chief, but it was one to which he frequently referred), was that he could not bear the insipidity of the country;—such a man could not possibly be a fully qualified judge of some of the highest beauties of poetry. How differently does the poetical temperament of Cowper speak out, in that passage of the *Task* wherein he alludes to Cowley, as

> ——"stretched at ease in Chertsey's silent bowers
> Not unemployed, and finding rich amends
> For a lost world in solitude and verse."

His own ardent attachment to the country finds expression in the exclamation—

> "I never framed a wish, or formed a plan
> That flattered me with hopes of earthly bliss,
> But there I laid the scene."

And a greater man than either Cowley or Cowper has left on record one of the most touching and simple longings to escape from "the noise and opposition" of London to more congenial scenes, which was ever penned. "My Lord," says Richard Hooker to Archbishop Whitgift, after giving an outline of his work on Ecclesiastical Polity, "I shall never be able to finish what I have begun, unless I be removed into some quiet parsonage, where I may see God's blessings spring out of my mother earth, and eat my own

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* Johnson's *London*.

bread in privacy and peace." This was a feeling Johnson could neither estimate nor properly understand; but the want of it is a fatal disqualification for forming a sympathetic and therefore just judgment of poetry.

I shall now endeavour to show how much he was mistaken in his estimate of Cowley.

Speaking of the "Metaphysical Poets," and of Cowley as one of them, he says, "They cannot be said to have imitated anything; they neither copied nature, nor life;" and again, "their thoughts are often true, but seldom natural." Turn to Cowley's address to the "Old Patrician Trees," in his Essay on Solitude:—

"Here let me, careless, and unthoughtful lying,
Hear the soft winds above me flying,
With all their wanton boughs dispute,
And the more tuneful birds to both replying,
Nor be myself too mute.
A silver stream shall roll his waters near,
Gilt with sun-beams here and there,
On whose enamel'd bank I'll walk,
And see how prettily they smile, and hear
How prettily they talk."

The next quotation will remind us of Burns' exquisite song, beginning, "Ye banks and braes"—

"How could it be so fair, and you away?
How could the trees be beauteous, flowers so gay?
Could they remember but last year,
How you did them, they you delight,
The sprouting leaves which saw you here,
And call'd their fellows to the sight,
Would, looking round for the same sight in vain,
Creep back into their silent barks again."

In anticipation of a happy marriage, he thus speaks of her name:—

"Then all the fields and woods shall with it ring,
Then echo's burden it shall be;
Then all the birds in several notes shall sing,
And all the rivers murmur thee:
Then every wind the sound shall upwards bear,
And softly whisper it to some angel's ear."

But there is a strength and vigour in many of his passages which must not be overlooked. The following extract is from the first Book of the *Davideis*—

" Beneath the mighty ocean's wealthy caves,
Beneath the eternal fountain of all waves,
Where their vast court the mother-waters keep,
And undisturbed by moons, in silence sleep,
There is a place, deep, wondrous deep below,
Which, genuine night and horror does o'erflow;
No bound controls th' unwearied space, but Hell
Endless as those dire pains that in it dwell.
Here no dear glimpse of the sun's lovely face
Strikes through *the solid darkness of the place;*
No dawning morn does her kind red display;
One slight weak beam would here be thought the day.
No gentle stars with their fair gems of light
Offend the tyrannous, and unquestioned night.
Here Lucifer the mighty captive reigns;
Proud, 'midst his woes, and tyrant, in his chains."

The next lines are more fearfully expressive. The scene is an infernal conclave:—

" The quaking powers of night stood in amaze
And at each other first could only gaze.
A dreadful silence fill'd the hollow place,
Doubling the native terror of Hell's face:
Rivers of flaming brimstone, which before
So loudly raged, *crept softly by the shore:*
No hiss of snakes, no clank of chains was known,
The souls amidst their tortures durst not groan."

By way of contrast to these powerful but repulsive pictures, let us glance at another fine passage in the same poem:—

" Above the subtle foldings of the sky,
Above the well-set orbs' soft harmony;
Above those petty lamps that gild the night,
There is a place o'erflown with hallowed light;
Where heaven, as if it left itself behind,
Is stretched out far, nor its own bounds can find:
Here peaceful flames swell up the sacred place,
Nor can the glory contain itself in th' endless space.
For there no twilight of the sun's dull ray
Glimmers upon the pure and native day.
No pale-faced moon does in stolen beams appear,
Or with dim taper scatters darkness there.
On no smooth sphere the restless seasons slide,
No circling motion doth swift time divide;
Nothing is there to come, and nothing past,
But an eternal now does always last."

The *Davideis* from which these passages are taken was never finished,

nor, as the author himself tells us, were the Four Books which he did complete, ever revised "with that care which he had resolved to bestow, and which the dignity of the matter well deserves." But no man had a more exalted idea than he of the grandeur and sublimity of the incidents in Scripture story, and of their capability of being woven into the loftiest verse. He closes his preface with this striking passage:—"All the Books of the Bible are either already most admirable and exalted pieces of poesie, or are the best materials in the world for it. Yet though they be in themselves so proper to be made use of for this purpose, none but a good artist will know how to do it: neither must we think to cut and polish diamonds with so little pains and skill as we do marble. For if any man design to compose a sacred poem by only turning a story of the Scripture . . . or some other godly matter . . . . . into rhime; he is so far from elevating of poesie, that he only abases divinity. In brief, he who can write a profane poem well, may write a divine one better; but he who can do that but ill, will do this much worse. The same fertility of invention; the same wisdom of disposition; the same judgment in observance of decencies; the same lustre and vigour of elocution; the same modesty and majesty of number; briefly, the same kind of habit, is required to both; only this latter allows better stuff, and therefore would look more deformedly, if ill drest in it. I am far from assuming to myself to have fulfilled the duty of this weighty undertaking, but sure I am, that there is nothing yet in our language (nor perhaps in any) that is in any degree answerable to the *idea* that I conceive of it. And I shall be ambitious of no other fruit from this weak and imperfect attempt of mine, but the opening of a way to the courage and industry of some other persons, who may be better able to perform it thoroughly and successfully." It is surely not without significance, as a comment upon this final sentence, that in the very year of Cowley's death, *Paradise Lost* appeared.

I do not pause to point out the resemblances which may be traced between many familiar passages in modern poetry and some which are to be found in Cowley. That is a branch of literary investigation, which, if followed out, would reveal some curious facts. I hope some member of the Society having the requisite leisure may be induced to take up the subject, and bring his reading to bear upon it, in its threefold aspect of unconscious resemblance, avowed imitation, and arrant plagiarism.

Perhaps, after all that has been said, it may seem strange to conclude with the admission that, in spite of all his merits, Cowley will never be popular. Yet no student of English literature will do justice, either to his subject, or to himself, who passes by the works of Abraham Cowley. I think I have given sufficient reasons for paying some attention to his

GROTESQUE

MASK OF PUNISHMENT,

from the Castle of

NUREMBERG.

poetry; but his prose is more admirable still. Like Dryden, he is known chiefly—I may almost say exclusively—in one character. His reputation as a poet has prevented his being known, much less appreciated, as an essayist. But if "the varying verse, the full-resounding line" of Dryden, and the more artificial numbers of Cowley, were henceforth obliterated from human knowledge, both would live, and would deserve to live, in the admiration of their countrymen, for qualities in their prose writings, of a high and uniform excellence, such as the most partial critic could not claim for their poetry, though, strangely enough, the poetry, with its inequalities and its faults, has hidden from view the more perfect graces of the prose.

On a Grotesque Mask of Punishment obtained in the Castle of Nuremberg.

By Frederick W. Fairholt, Esq., F.S.A.

(Read 14th December, 1854.)

In the Museum of Antiquities, collected by my fellow Member of the Society of Antiquaries of London, Mr. Joseph Mayer, I have observed, with some curiosity, the very rare example of a scold's bridle which he possesses. Such relics of the olden time are of great rarity; and of the small number known to exist, the majority belong to places whence they cannot be dissevered. In the church of Walton-on-Thames, about 20 miles from London, is one of these implements, which is said to have been presented for the use of the Parish by a neighbouring gentleman, who lost a considerable estate, through the babbling of a mischievous woman to the relative from whom he would have received it. Upon it was inscribed the date 1633, and the distich, now quite obliterated,

"Chester presents Walton with a bridle
To curb women's tongues that talk too idle."

The punishment originated at a period when some degree of ridicule was allowed to take the place of that severity which characterized earlier forms of punishment. Like many other of our customs, it would appear to have

originated on the Continent; and I exhibit to you this evening a drawing of a somewhat similar Mask, which I purchased at Nuremberg about four months ago, and which is now in the valuable collection of the Lord Londesborough, at Grimston Park, near Tadcaster, Yorkshire. It is constructed of bands of iron, and is made to fit closely over the head, being secured at the back by a padlock. A flat piece of iron covers the mouth, and closes upon it so entirely, that if the person upon whose head it is placed attempts to speak, the voice is collected toward a small hole in the centre, ascends up the wooden nose by means of a small pipe, and ends in being expelled by a loud whistle. It is thus impossible to speak, the man attempting it but makes himself ridiculous, and to do this the more thoroughly, an ass's ears are affixed to the sides of the head, and a huge pair of spectacles over the nose; a mouth is painted over the mouthpiece, and eyebrows over the spectacles. It was probably manufactured toward the end of the sixteenth century, a time when judges began to believe that a feeling of shame might be useful in preventing petty infringements of propriety. Grotesque masks, of a somewhat similar kind, were used in Germany to punish refractory soldiers, one of which is in the Armoury at Goodrich Court, and which Sir Samuel Meyrick, who owned this collection, thought to be of the time of Henry VIII. It is constructed of wood, in imitation of the hood worn by the jesters who formed part of a noble's retinue at that period, and has a high crest with bells attached, which ring on the slightest movement of the wearer. It opens with a hinge behind, and is secured beneath the chin by a padlock. As the elevated bells supplied the place of a crest to this grotesque helmet, the representation of the wreath usually encircling the knightly one is carved below it, to make the absurdity more perfect. It is quite probable that this, and similar military grotesque punishments, originated in the continental customs of an earlier date. Lord Londesborough's collection affords another example of a skeleton mask which he also obtained from a German collection, but without the peculiarity I have pointed out in the mouthpiece of that to which I now call attention, and which I consider by far the most curious mask of the kind in existence.

I should be disposed to date the introduction of these and similar instruments of cruelty to northern Europe, to the accession of Charles V. of Spain to the throne of Germany. The period of the introduction of

the most refined cruelties into the famed old city of Nuremberg is fixed by its historians to the year 1533, and the character of the tortures then, for the first time imported, is of so startling a kind as to be adverse to the ordinary feelings of nations to whom "the most holy Inquisition" is happily unknown. During the Spanish ascendancy in Germany, Brabant, and Flanders, the vaults of their Hotels-de-Ville might rival the Spanish cells in the various implements they contained; some few of which still exist, particularly in the old German towns, such as Saltzburg, Bamberg, Nuremberg, and Ratisbon, the latter having by far the most complete collection, constructed with a perfection of cruelty, and christened with jocular names; an instance of the heartless indifference to human suffering, and fiendish malignity which characterized the judicial proceedings of the middle ages.

Torture, as a means of extorting confession of crime, appears to have been slowly and sparingly adopted in England; and, to the honour of our country, was never acknowledged by the law of the land. Religious intolerance seems to have allowed it a more unquestioned scope than the ordinary tribunals admitted; and we must refer to the pages of such authors as John Foxe if we would know much of the practice in England. From a comparison of his descriptions with such others as are contained in Millæus's curious and horrible book, *Praxis Criminis Persequendi* (Paris, 1541), we may trace all these barbarities to the one source, and that the Spanish and Italian torturers; who seem to have exhausted their inventions in ingenious cruelties, which they worked into practical use with a finish and a neatness of manipulation, as if they delighted in their horrible employment.

The connection of constructive idea between the Mask from Nuremberg, and the English "Scolds' bridle" and Scottish "Brank," will be apparent, I think, to most investigators. Its disuse in both of the latter countries is comparatively modern; and it appears to have been more common and occasionally more cruel in the north than it was among ourselves. Thus the "Witch's Bridle," once preserved in the church at Forfar, was provided with a gag for the mouth made in form of a triple spur, which was capable of inflicting horrible wounds on the unhappy "witch" who attempted to speak, when led to the stake, with this upon her head. The ordinary "Brank" for a scold simply restrained her tongue; and its name

was the same as that applied to a rude substitute for a bridle. An example preserved at St. Mary's Church, St. Andrew's, is said to have been affixed to the heads of the early Scottish martyrs at the stake; another was found behind the panelling of the old house of the Earls of Moray, in the Canongate, Edinburgh.

Of the English "Scolds' Bridle," one of the earliest engraved examples is that given by Dr. Plot in his "History of Staffordshire," and which he says "being put upon the offender, by order of the magistrate, and fastened by a padlock behind, she is led round the town by an officer to her shame; nor is it removed till after the party shows, by all external signs imaginable, humiliation and amendment." Brand, in his "History of Newcastle-upon-Tyne," engraves another example, which Gardiner, in his "England's Greivance," 1655, declares he saw in use, and the iron tongue "forced the blood out" of the unfortunate woman's mouth who then wore it. Another is in the Town Hall at Worcester; one is in private hands at Leicester, once belonging to the Town Hall there. The curious inscribed one in the church at Walton-on-Thames has been already noticed. The Town Council of Lichfield also possesses one of these bridles; another is at Beaudesert, the seat of the Marquis of Anglesey; but by far the most curious example is preserved at Harnstall Ridware, in Staffordshire. It has apertures for the eyes and nose, giving the face a grotesque appearance, and towers above the head like the cap of a grenadier. In this way it connects itself with the Military Mask at Goodrich; as that, by its grotesque character, is connected with the German one I have exhibited this evening.

I have thus endeavoured to show that the principle, both of the invention and construction of these antique grotesque implements of punishment, has evidently emanated from the same source. As very rare examples of ancient manners, they are worthy the attention of all who study what are frequently termed the "good old times," and who may, by that study, learn to be thankful that they did not live in them.

On some Correspondence of Dr. Priestley, preserved in the Warrington Museum and Library.

By J. F. Marsh, Esq.

(Read 19th April, 1855.)

It is no part of my object this evening to enter upon or to provoke a discussion of the merits or demerits, personal, political, or scientific, of Dr. Priestley, but I may venture to assume that his name will be generally received as so illustrious in the world of science, and so remarkable in that of politics, that a series of letters from him, extending over a period of twelve years, may command a small portion of the attention of the Historic Society of Lancashire and Cheshire, though it does not happen to embrace that portion of his life during which he was connected with these counties by his residence at Nantwich, and subsequently at Warrington, as one of the tutors at its celebrated Academy. The correspondence of any man taking as active an interest as Priestley did in the stirring events of his time would be worth perusal, were it only for the sake of comparison with the ideas and temper of our own day; and that these letters partake of this description of interest may be inferred from the circumstances which led to their preservation and deposit in the Warrington Museum and Library, whence I have brought them for your inspection.

In a letter dated 4th October, 1791, he writes to his brother-in-law, Mr. Wilkinson:—

> "I am glad that you approve of my views with respect to France. *Now* I think it must be evident to every body, whether they will acknowledge it or not, that *that* country must rise and that *this* cannot well go higher. Whether any addition be made to our burdens or not they must begin to be felt heavier and heavier, and the wretched illiberal spirit of the court will make it despicable. * * * I spoke to Mr. B. Vaughan, who has placed my money in France, and he says he will write to you about yours. * * * He has already placed a considerable sum in the French funds, and many, I doubt not, will soon do the same, as was the case with the American funds, which have risen 30 per cent. since I placed what I could in them. Mr. Russell got 30 per cent. per annum by some money that he happened to have in their funds at a very critical time."

His correspondent expresses his entire accordance with these sentiments, and remits £5000 for investment in stock, in a country which he looks upon both as favorable for manufacture and commerce, and as a place of refuge from persecution. This sum appears to have been subsequently made over to Dr. Priestley. Within less than eighteen months he writes that he considers the money invested in the French funds as lost, and from that time till the year 1798 the correspondence narrates the efforts he was making to recover from the French government a portion, however small, of the wreck of his property. At last he writes from America on the 15th of March, 1798 :—

> "At the solicitation, I suppose, of Mr. Adit, the late Ambassador from France, the Directory have made an arret in my favor. It is sufficiently complimentary, but the benefit I shall derive from it is very little, if anything at all, while I am here. They allow me in cash 1200 livres per ann., which is about £50 sterling, till the interest of my money in their funds shall amount to as much. Their funds must be very low indeed if £10,000 do not yield fifty per ann. when we were led to expect £600."

It is to the constant allusions to this subject, and the pecuniary transactions between Dr. Priestley and his brother-in-law, arising from the difficulties in which the former was involved by his misplaced confidence in the credit of the French Republic, that the preservation, as a mere matter of business, of between sixty and seventy most interesting letters is to be attributed. After lying for half a century among the papers which had come to the hands of the firm which I represent, as Mr. Wilkinson's family solicitors, I accidentally stumbled upon one which from its signature interested me as an autograph, and finding that it was not a mere nugget, but that the whole bundle was auriferous, I arranged the correspondence in order, and procured the consent of Mr. Wilkinson's family to its deposit in its present place of preservation.

Before describing the correspondence more particularly it may be convenient to sketch very slightly the history of Dr. Priestley, down to the date at which it commences. He was born of respectable parents, of Calvinistic tenets, in the West Riding of Yorkshire, in the year 1733, and his education was commenced at a school at Batley, and completed by Dr. Ashworth at Daventry. In after life his religious opinions differed materially from those of the school in which he was brought up, and at

successive periods he passed through all the changes from Calvinism to Arianism, and Socinianism, but remained through the whole progress a firm believer in the Jewish and Christian revelations, according to the testimony of his biographer Dr. Aikin, who warmly defends him from the charge of having held even more extreme opinions. At the age of 22 he took charge of a congregation at Needham Market, in Suffolk, and afterwards removed to Nantwich, where he remained until, in 1761, he became tutor in the department of Polite Literature in the Warrington Academy, and shortly afterwards married a sister of the gentleman to whom the principal portion of the letters to which I have to call your attention are addressed, Mr. Wilkinson, a celebrated Ironmaster in Staffordshire and North Wales. It is not necessary that I should detain you with any notice of the various works by which Dr. Priestley now began to make himself known, in the world of Literature and Science. Suffice it to say, that at the close of his connection with the Warrington Academy in 1768, he had obtained a more than European reputation by his researches in Chemistry, Electricity and Optics. After a short residence at Leeds he accepted an engagement with the Earl of Shelburne, which, in the nominal capacity of his Lordship's librarian, or literary and philosophical companion, afforded him an opportunity of devoting himself to his favorite pursuits, and retiring from it after some years with a liberal pension, with the aid of which, and additional subscriptions from several friends of science to enable him to carry on his experiments, he determined to devote himself to philosophy; and settled at Birmingham, for the purpose of deriving the utmost advantage from the mechanical resources of the workshop of the world. It would have been fortunate for his memory if such pursuits had engrossed the whole of his attention, though it is only justice to say that the space which he occupies in the politics of the period is less attributable to the extent to which he took part in political discussions, than to the fact of his having been the principal victim of those savage riots which disgraced the town of Birmingham, when popular violence, aroused by a public dinner on the 14th July, 1791, (at which however Dr. Priestley was not present) to celebrate the destruction of the Bastile, was directed against him on account of the favorable eye with which he was supposed to regard the French Revolution: and amidst the conflagration of places of worship and private property, his house, his library, manuscripts, and

philosophical apparatus were consigned to the flames, and (to use the language of Mrs. Barbauld),

> " the name
> " On which delighted science loved to dwell,
> " Became the bandied theme of hooting crowds."

It is shortly before this period that the correspondence commences, and the following letter dated from London the 20th August, 1791, gives an interesting picture of the state of public feeling on the subject :—

> " You were so obliging as to give me an invitation to any of your houses in the present unsettled state of my affairs, and having continued here nearly as long as was convenient for me, on account of receiving and answering letters, I shall be happy with your leave to spend a month or 6 weeks at Castlehead, especially as I understand that you are there yourself. I shall never forget how agreeably I passed my time there before, and what satisfaction I had in composing several of my works in your *Wren's nest.* There I wish to finish *an Appeal* that I am writing *to the public on the subject of the riots in Birmingham,* which I intend to publish, not immediately, but some time hence, when it will probably have a greater effect. My son William is with me, and as unsettled as myself. He was to have been 3 years with Mr. Russell, in order to his being afterwards settled in America, but as it is now probable that I shall not return to Birmingham, it will be an uncomfortable place for him. He exposed himself much in the riots in saving what he could of our things, and was so marked by the rioters as to be in much danger. Besides the great fatigue he underwent required some recruit. He therefore came hither, and is very useful to me as an amanuensis, and in that capacity, if you please, I will bring him with me to Castlehead. * * * The Dissenters at Birmingham have been much dispirited, but they now begin to take courage in consequence of having discovered some very foul practices of their adversaries, which must expose them to infamy. The particulars Mr. Russell forbears to mention, but among other things he has in his possession a *forged letter* which was made use of to inflame the mob both at my house and his. The magistrates, who deserve the severest punishment, have had the thanks of a Town's meeting, and presents voted them, and Mr. Galton informs me that they have sent *an Address to the King* so fulsome and abject as must disgrace them for ever, while that of the Dissenters is manly and does them credit. * * * I thank God I never enjoyed better health or spirits than I have done since this affair, nor has it lost me a moment's sleep, except in consequence of being driven about four nights running, without being able to go to bed except for a few hours."

In another letter from London, on the 8th September, on the same subject, after arranging his plans for a visit to Castlehead, he writes :—

"In our way I have promised Mr. Wedgwood to call upon him, and may make a short stay there. I had proposed to go by Manchester, but I find by a letter just received from Joseph that my friends there are afraid to receive me. Thus the chased deer [he had written "stricken," but his spirit rebelled against the word] is avoided by all the herd. To give you some idea of the state of things at Birmingham, having a cover, I enclose a letter just received from Mr. Galton. I also enclose a *Dialogue* which has made some noise in Birmingham from being supposed, in the present state of men's minds, to contain much treasonable matter. It has been represented to be as bad as the *Handbill;* and the printer's boy has been in custody. The printer advertizes it, and says that the writer would appear when called for. At length they have found nothing treasonable in it."

Mr. Galton's letter alluded to in the above is as follows:—

"I have this moment only received your favor by Mr. Wm. Priestley, and rejoice most sincerely in the idea of seeing you. If you incline to come to Birmingham, which I think much better and more honorable, pray inform me the hour you expect to arrive and where, for I will meet you at the coach and accompany you in your perambulations about the town, happy in an occasion to avow the most explicit attachment to a person whose friendship does me the greatest honor. If you leave the coach at what was once your house, I will meet you there. It shall never be said that Dr. Priestley was not received with open arms by one on whom he has conferred such obligations. The idea of fear Mrs. Galton and myself equally despise, nor do we really think there is any danger, but if the alternative were that we should lose our house or our esteem for ourselves, would not pause a moment." * * *

In an undated letter, written in the same month, after alluding to his "sad disaster at Birmingham," and mentioning his determination to take up his abode at Hackney, he writes:—

"It is now evident, from a variety of circumstances, that Government is not displeased with the riots in Birmingham. Some of my friends, who had occasion to wait on Mr. Dundas, say he did nothing but rail at the Dissenters in general and myself in particular; and Bishop Prettyman, Mr. Pitt's tutor, has lately delivered a flaming charge against us. Also the first sermon which was preached before the King at Weymouth was against Sectaries, this being considered as the surest road to preferment. On this account I consider my stay in this country as very uncertain. Many of my friends seriously think of going to France, and the neighbourhood of Pigou in Burgundy has been pointed out as convenient for their manufactures. If this should take place, and my son William get a settlement in France, which I hope my friends there will find for him, I shall probably go too. Joseph says that many Dissenters will probably emigrate from Man-

chester, and that if all be well he will be able to go too in a few years to great advantage. I have been advised by Mr. Vaughan to put the £500 you kindly sent me into the French funds, and the rest of my little property is in the American funds. I wish to have as little in this country as possible. I am told it is the wish of the ministry to drive me away, and in this we shall soon be agreed."

I have already quoted from a letter of the 4th October, with reference to the French funds, but the following extract is too curious to be omitted:—

"I think I told you that I had the offer of a completely furnished house near Paris. To-day I have received a very flattering address from a society at Thoulouse, in the name of the town and neighbourhood, inviting me to reside in the south of France, and intimating that one of the now vacant monasteries will be destined for my use. I have however now absolutely taken a house at Hackney, and have taken measures to fit it up for my use. Whether I shall succeed Dr. Price is uncertain, as some of the more timid part of the congregation are apprehensive of a tumult if I should settle there."

On the 23rd November, 1791, he writes:—

"I wish to put into your hands my *Appeal to the Public*, in its present state. Several of my friends in Birmingham wish to have it either suppressed or much softened, but my friends here approve of it as it now is. I wish to know how it strikes *you*. In my own opinion, if I write at all, it ought not to be with less spirit than I have usually shewn, and there are as bold and as offensive things in several of my former publications as in this. However, if cancelling a few leaves will satisfy my friends, I shall have no objection to do it. The publication will be in good time if it be about the meeting of Parliament. * * * I have got into the house I have taken at Clapton. * * * If it was not that I must have room for a Library and Laboratory, it is larger than I ought to have, but without room for these things, though they be expensive, I am useless, and the few years of active life that according to the course of nature I may yet enjoy, I wish to make the most of. I proposed to my congregation at Birmingham to go down and preach to them till Christmas, but they thought it unsafe, and last Sunday Mr. Coates delivered the sermon that I had composed for the opening of their new temporary place, which was a riding school. On Sunday se'nnight I began to preach at Hackney, but the fears of many of the congregation are not yet wholly vanished. I am now unpacking such of my books and papers as my friends have been able to save from the general wreck, and it is indeed affecting to see the shocking havock that has been made of them though more things are preserved than I could have expected."

The bitterness of public opinion against him seems to have increased, rather than diminished. On the 18th February, 1793, he writes:—

"You may justly think yourself happy in being out of the *Mania*, as you properly call it, that prevails here. I really begin to think myself not quite safe. I can give you no idea of the rancour that is now more than ever prevalent against me, as it shews itself in hand-bills, and every other way calculated to excite mischief. However, I keep myself as quiet as I can, and perhaps in time the storm may blow over. Your sister, who never was alarmed before, begins to be so now, and if my sons can get settled in France or America, will have less objection to follow them than she had some time ago."

On the 19th of March, after mentioning that his son William had arranged to emigrate to America, he adds:—

"What he can do when he gets thither I cannot tell, but there was no other choice for him. No son of mine can ever settle in this country, unless things should take a turn that we have no reason to expect."

In the same letter he writes:—

"Your sister is a good deal better, but much distressed about getting servants. Our cook-maid is just married, and the other is to be so soon; and so violent is the spirit of party, that it is hardly possible to get a servant, and those we have are exposed to so much abuse from the neighbours of the lower class, that it is as much as they can bear. I have proposed to her to give over housekeeping for a time."

I have dwelt at so much length on this particular portion of the correspondence, from its bearing on the personal history of Dr. Priestley, and the picture it affords us of the state of public feeling, that I must pass somewhat more rapidly over other subjects. He alludes from time to time to the settlement of his sons successively in America, and at length he writes on the 16th of May, 1793:—

"When all my sons are settled in America, I do not think I shall stay long after them, especially if a scheme, that my son says is talked of, of establishing a liberal college in the back settlements of America, should be carried into execution. In this case I would go soon, and devote myself wholly to it. My own library (to which Mr. Lindsay will add his) and apparatus will make a good beginning. The colleges they have in the old towns were in a great measure, I believe, founded by Englishmen, and I do not think men of fortune can perpetuate their names more effectually or usefully than by such foundation in such a country as America. The college here is likely to fail for want of sufficient support, and the money contributed to it has been laid out so improvidently, that few persons will be disposed to give it any assistance."

The plan alluded to in the last letter was temporarily abandoned, but in

an undated letter, apparently written about September, 1793, after alluding to a suggestion of a friend to make a purchase in America, he writes:—

"I have not, however, complied with his request, because if I had, and nothing could be got from France, I should have nothing to subsist on when I got to America. I have desired him to lay out £2000, which I mean for the use of William and Harry. I give up something more than £300 per annum in leaving this country, and what employment I shall be able to get there is uncertain. It will probably be in some of their colleges, for I cannot expect to get anything as a preacher, at least for some time, and on account of my age it could not continue long. As a lecturer I may hold out longer. To abandon an advantageous and agreeable situation for such an uncertainty, so late in life, is sometimes rather painful, but it is absolutely necessary, and I trust in that good Providence which has attended me hitherto, and on my own exertions. If what you have generously given me in the French funds yield anything near its value, I shall be quite easy. To make this more secure, I have been with the American ambassador, to acquaint him that I am going to settle in America, as a citizen of the United States. This he is to transmit to France, which it is thought will secure my property there. He thinks there will be no American war, unless the combined Powers succeed against France. There are, however, he says, some in the Cabinet here who wish to provoke the Americans to hostility, thinking it better to have them open enemies, than as they believe them to be, secret ones. The piracies of the Algerines, he says, were certainly produced by the English consul at Algiers. As all my friends advise me to go as soon as I can, I have taken my passage in a vessel that is just arrived from New York, and purposes to sail again the middle of next month, but it will probably not be till the end of it, or the beginning of the month following."

On the 9th of January, 1794, he writes:—

"The person who brought me Mr. Drewley's letter, said there was an address to me, signed by the principal gentlemen of New York, encouraging me to settle with them, and, as he thought, requesting me to undertake some department of their college. I have not yet received it. If I do, I shall not hesitate to accept of it, as that would make my leaving this country a little more easy and more reputable."

His last letter in England is dated on the 7th February, 1794. He says:—

"I do not pretend to leave this country, where I have lived so long and so happily, without regret; but I consider it is *necessary*, and I hope the same good Providence that has attended me hitherto will attend me still. I am preaching, and at the same time printing, a set of Discourses on the Evidences of Revelation, and in the preface to

them, or to a Fast sermon which I shall publish, I propose to take leave of this country."

On the 14th of June he announces his arrival in New York. The following account of his reception reminds us of what we have read of American receptions of notables nearer our own day :—

"I have been received here in a manner very flattering to me, almost every person of consequence in the place having visited me, and many addresses having been presented to me, which, with my answers, are printed in their newspapers, and circulated through the Continent. This is rather troublesome to me, but could not be avoided."

From Philadelphia he writes :—

"We have now been here a week, and I can give you a better account of our probable destination than I could do before. I have been received with the most flattering attention by all persons of note, as I was at New York, which, though troublesome, promises well with respect to my settlement in the country. I am much pressed to take a house and reside in this city, but the expense of living here is so high, that I could not well do it, without giving lectures, or binding myself to some employment, which would interfere with my philosophical and other pursuits, whereas, if I reside in Northumberland, the country town the nearest to our proposed settlement, the expense will be much less, and I shall have more leisure. Besides, your sister, as well as myself, dislikes living in such a city as this. We want no more society than we shall have among ourselves at Northumberland, and I can reside a month or two every year in this city during the sitting of Congress, which will in all respects answer as good purpose as living constantly here. The greatest objection relates to the difficulty and expense of getting all my packages from this place to Northumberland, but the expense will be compensated by the difference of expense in one year's living. Besides that, provisions are as dear in this place as in London ; house-rent and firing are much higher. Such a house as I have generally lived in in England would be here at least £150 sterling per annum, and firing would be about half as much, but then the taxes are inconsiderable. At Northumberland as good a house will not exceed £30 per annum ; firing will cost nothing but the cutting of the wood, and provisions about one half. It is to be feared, however, that the high prices of everything will gradually extend to the country. The rise of prices, or depreciation of money, has been cent per cent in little more than two years, owing, it is supposed, chiefly to the introduction of paper money. This circumstance has had an extraordinary effect in quickening the industry of the country, making it highly advantageous to the man who has everything to sell, but hard upon the man who must buy."

The accounts he gives from time to time of his situation and prospects

in America would lead me too much into detail; but the following extract from a letter dated 24th July, 1795, may serve as a specimen:—

"I think I told you that my son Harry was farming for himself. For activity, industry, and good judgment (as judges say) he has few equals, though he has many difficulties to struggle with, his land being all to clear. He lives in what is called a *log-house*, which has only one room, and a garret containing hay and straw above him. He is about, however, to build a stone house, with two rooms, but no second story. William is returned from Boston, where he had the ague all the winter. He, though tender and delicate, is to take part of Harry's land, and they will build near together. Notwithstanding their educations, the minds of all my sons, I am happy to perceive, are not above their condition. William is to marry a young woman, daughter of a reputable farmer, and one who has been used to the management of a farm some years, for she is about 23, and is the eldest daughter of a pretty large family. He consequently expects no fortune, and yet he is not at all discouraged. As he has lost much time, and suffered much in France and elsewhere, I think it right, and his brothers think so too, that he should have something more than they, and I propose to give him £300 more than his thousand, though I cannot do it immediately, the house I am building, some purchases with a view to it, and the settlement of Harry (though I have not as yet given him more than £500) having taken all that I can at present spare. But with moderate industry, any man may do well enough here. We hope to get our college established the next year, and if it yield me any income, I shall be better able to help my sons. Your sister is rather too fully employed in fitting up our temporary house and providing everything for the other. In all this I take no concern, but I am now as busy in my own way, writing and experimenting, as in any period of my life. I shall soon add two more volumes to my *Church History*, and I am about to send to the Philosophical Society of Philadelphia an account of some experiments I have lately made in pursuance of those I began at Hackney. Considering the distance I am at from the sea, I am better situated for experiments than you would imagine. We have ingenious workmen of almost every kind in this place, so that I hardly want anything but a glass house. Living so far from a sea port, I have found great difficulty in sending what I have printed here to England. One, however, by accident, has got thither, and Mr. Lindsay has reprinted it. It is my *Answer to Mr. Paine*, of which he had my directions to give you a copy. I hope you have received it. I am now printing *Observations on the Increase of Infidelity*, and hope to have better success in sending it."

Another from Philadelphia on the 22nd of April, 1796:—

"I was engaged to spend about two months in this city, in order to deliver a course of sermons on the Evidences of Revelation, and, if possible, to establish an Unitarian congregation here. I have delivered

one of the discourses to a very numerous and respectable audience, especially of the members of Congress, and everything promises well. I am determined to decline all pecuniary advantage from the scheme, and as I am a guest of Mr. Russell, who has a house here, my expenses are not great; otherwise I could not support it. I have been at the President's, who invited me to call without ceremony. We drank tea with him as in any private family. Everything here is the reverse of what it is with you. I do not think there is an example in all history of any country being in so rapid a state of improvement as this is in at the present time. But in proportion as it is advantageous to the laborer, it is heavy on the man who must live on the labor of others. Living here is I think not less than twice as expensive as in any part of England, and the wants of Europe raise the price of our produce, and consequently, of everything else. All our late accounts from England are very alarming, so that I cannot help wishing that all my friends were here, where at least there is *peace*, and no apprehension of any disturbance."

From Northumberland he writes on 28th July, 1796:—

"What I wish for *you* is all that I hope for myself, a quiet and comfortable old age, which I find coming upon me, on which account I decline everything which requires more exertion than I know I am capable of. A college is now building in this place, and I am chosen president; but I shall only accept of it till another can be provided, and that on condition that I have no concern with the *discipline* of the students, and my lectures will be given *gratis*, as they were at Hackney. If I can barely subsist, I shall be content with it rather than take an employment, with the difficulties of which I am not now able to contend. By this time I hope you have received a copy of some *Discourses*, which I delivered at Philadelphia in the course of the last winter. I have also printed the *Philosophical Tracts*, which I hope will soon reach you. By these you will find that I have not been idle. Indeed, I hope to do as much here as I ever did in England in the same time, though destitute of many advantages which I had there, especially when my house is built, and my laboratory fitted up; but in this I find much difficulty and delay that I did not expect, besides that the expense will be twice as much as I calculated for, not so much owing to calculating wrong, as to the astonishing advance of the price of everything, especially of labor. The like was, I believe, never known in any age or country. But it is owing, in a great measure at least, to the unexampled flourishing state of the country, which is indeed in a most rapid state of improvement, both in this place and everywhere else."

In a letter from Northumberland, on the 17th December, 1795, he mentions the illness of his wife, and the death of his son Henry. After relating the particulars of the latter event, he writes:—

"He was indefatigable in the attention he gave to his farm, and had just built a little stone house, which was nearly ready to be occupied. * * * Considering how delicate his constitution was, and that his education was for a learned profession, it was something extraordinary that he should so cheerfully submit to all the drudgery of a common farmer. It was the wonder of everybody. Had he been brought up an American farmer, he could not have been more industrious. Indeed, the Americans are not remarkably industrious. They can do very well without hard labor, and, therefore, will not in general submit to it. The English emigrants, it is observed, work much harder than they. This being the first stroke of the kind, it affects me more than I can express, though I hope I do not complain of the dispensations of Providence, which, I doubt not, are always right and wise, but my chief consolation is the expectation of meeting him again in a better state. * * * Your sister has had several very alarming spittings of blood, and has now a very violent cough, occasioned by sitting up three nights with Harry. Her trials have been in several respects very great. For three months, a great part of which time she was confined to her room or her bed, she had no maid-servant, and now we only hire a black slave by the week. The country is in too prosperous a state for servitude, and it is observed that the difficulty of getting servants increases continually. All that can be had are young boys or girls."

Nine months afterwards Mrs. Priestley died, and the event is thus related in a letter, of the 19th September, 1796:—

"I sit down to inform you of the melancholy event of the death of my wife, who is to be buried this day. She was ill about a fortnight, and died about 11 at night on Saturday. Her illness was a fever, which very much affected her head, so that she had very little sense of anything for the greater part of the time, and though she seemed to suffer much at some times, she went off without any symptom of being in pain. I need not tell you what we all feel on the occasion. The death of Harry affected her much, and it has hardly ever been out of my mind, though it is now near nine months since he died, but this is a much heavier stroke. It has been a happy union to me for more than 34 years, in which I have had no care about anything, so that, without any anxiety, I have been able to give all my time to my own pursuits. I always said I was only a lodger in her house. She had taken much pleasure in planning our new house, and now that it is advancing apace, and promises to be everything that she wished it to be, she goes to occupy another. I shall, however, finish the house, as it is fitted for my use, as well as that of a family, and Joseph will live with me in it, for I am not able to manage a house myself."

On the same subject he writes on the 25th of January, 1797:—

"More than 4 months are now elapsed since that afflicting event,

and I do not think I shall ever completely recover the state of mind that I had before. I feel quite unhinged and incapable of the exertions I used to make. Having been always very domestic, reading and writing with my wife sitting near me, and often reading to her, I miss her everywhere; and if it was not for the great assiduity of my son Joseph, who is everything that I could wish him to be, and that of his wife, to make my desolate situation as comfortable as they can, I feel that I could not stay here. I should certainly return at all events to England: however, as things are, I intend to spend what remains of life in this country, only wishing, if there should be a peace, to make you one visit before I die."

In a letter from Northumberland, dated 30th November, 1797, after writing on his pecuniary affairs, he says:—

"With all my difficulties I have much to be thankful for. Hitherto few persons have had more enjoyment of life and their pursuits than I have had, and, without solicitude, my wants have been supplied by the friends of science and rational religion, to which I shall always devote myself. Though my philosophical friends have in general dropped their subscriptions to my experiments, which are much more expensive here than they were in England, my religious friends have not forgotten me. From Mr. Rayner I have received every year £50, and from the Duke of Grafton £40. These benefactions, however, I cannot depend upon, and should have declined accepting, if I could have had remittances from France. * * * Winter is set in with great severity, but my health is better than it was. I shall not go to Philadelphia this season, nor ever again to make any stay. Having done what I could there the two last winters, I shall avoid that great expence, and make the most of my leisure here, and I have work enough before me, both in Philosophy and Theology. Party spirit runs very high in this country. Though I take no part whatever in Politics, I am more grossly calumniated, as a supposed *Friend of France*, in the newspaper that has the greatest currency of any in this country, than I was in England. I do not think, however, that it will be in the power of our rulers to drag this country into a war with France; and if we have *peace*, things cannot go much amiss with us."

From this time, and indeed for some time previously, the principal topic of the letters is the state of the Funds invested in France. In the letter of 15th March, 1798, already quoted from, he writes:—

"Mr. Delacroix, the late minister of Foreign affairs, tells the consul here that if I would go and reside in France I should recover more than I have lost. If I could depend upon this I should think it right to go, though (at a great expence) I am now very comfortably settled here. * * * As I am acquainted with M. Taleyrand Perigord (late Bishop of Autun) the successor of Mr. Delacroix, I have written

to him, saying that if I had a proper assurance of the promise above mentioned, I should go, but whether my letter will reach him is very uncertain, and, at the most, I shall not be able to go till the next year. Mr. Russell, who has much property in France, is disposed to go too, and we shall (I think) go together, but not before a peace is made, and that most desirable event we hope cannot now be very distant. The affairs of England seem to be drawing to a crisis, and I cannot help being concerned for the event. I wish all my friends had such a quiet asylum as we have here. This country however is not without its difficulties. We are almost in a state of war with France, and what will be done is yet uncertain. I believe they will arm their ships for defence, and this I fear will lead to an open rupture. Either this measure or an embargo must be adopted, and the merchants seem to prefer the former. The hatred to France has risen to an astonishing pitch since I have been here, and as a supposed *Friend of France*, I am exposed to as much abuse as I was in England, though I have nothing to do with their politics."

On the 14th June, 1800, he writes :—

"The expence of printing a work, calculated I hope to promote the cause of rational Christianity, which I have most at heart, has been considerable, and the bookseller who had promised to take it upon himself, has declined it. A copy of this work will be sent to you, as also of a Philosophical Tract, by which you will see that I am not idle; and while I am successful in my pursuits, (and I was never more so than I have been of late) I am persuaded that the liberal friends of science would not wish me to desist, though the expence attending them is necessarily considerable; but thinking that I have now no occasion for any assistance, those who contributed to the expense of my laboratory in England have withdrawn their subscriptions. I hope, therefore, you will consider what you do for me as given to promote useful science and useful knowledge in general, to which, without any view to emolument, I have always devoted my time, and I wish to do so as long as I shall be capable of doing anything, which cannot now be long: and this I doubt not will be as powerful a motive with you as any relationship whatever. My gratitude will appear in the only manner in which I shall be capable of shewing it."

On the 17th July, 1800 :—

"My expenses have never been personal, but chiefly in the promotion of science and truth in general, to which I have devoted my time and whatever powers God has given me, and, therefore, I hope that the friends of science and of truth will afford me the assistance they have hitherto done. I am now as busy, and I hope as successful, as ever. My situation is in many respects favourable, especially with respect to *leisure* and *quiet*. As to the abuse to which I am exposed here, as formerly in England, I rather rejoice in it than am concerned

at it. It is what every man who does any good in the world must expect, and is much more than balanced by the approbation of persons of similar sentiments and views; and of such cordial friends I have never been destitute. We shall rejoice together in a world in which the wicked will cease from troubling. To that state I now look forward more than to anything here, as I cannot be very distant from it, though, I thank God, my health is very good, and I may yet do something more before I leave this scene."

His growing unpopularity in America, of which indications appear in several of the preceding letters, at length assumed a form which compelled him to defend himself; and on the 1st December, 1800, he writes:—

"Having been strangely calumniated in this country, and represented as a factious and dangerous person, become desperate by poverty, in consequence of speculating in lands, and being moreover told in confidence that Mr. Pickering, then Secretary of State, watched and threatened me, I thought it best to give a full account of all that I had done, and even thought, with respect to the administration. This I did in a series of *Letters to the inhabitants of Northumberland and its neighbourhood*, and the publication, though censured by many, has had a good effect. * * * It was with much reluctance that I wrote them, and I hope I shall have no further occasion to do anything in the same way. My theological and philosophical studies find me sufficient employment, and of a more useful and pleasing kind."

He does not appear to have overrated the success of his appeal, for on the 30th April, 1801, he writes:—

"That you may form some idea of the state of politics in this country, and see how favourable a turn things have taken with respect to myself, I send you a copy of a letter I have lately received from Mr Jefferson, and my *Letter to the inhabitants of Northumberland* will shew you what my situation was in the administration of Mr. Adams, or rather of those who for some time governed him."

The President's letter is too long for quotation; a single paragraph may suffice:—

"It is with heartfelt satisfaction that in the first moments of my public action I can hail you with welcome to our land, tender to you the homage of its respect and esteem, cover you under the protection of those laws which were made for the wise and good like you, and disclaim the legitimacy of that libel on legislation which under the form of a law was for some time placed among them. As the storm is now subsiding and the horizon becoming serene, it is pleasant to consider the phenomenon with attention. We can no longer say 'there is nothing new under the sun,' for this whole chapter in the history of man is new—the great extent of our republic is new—its

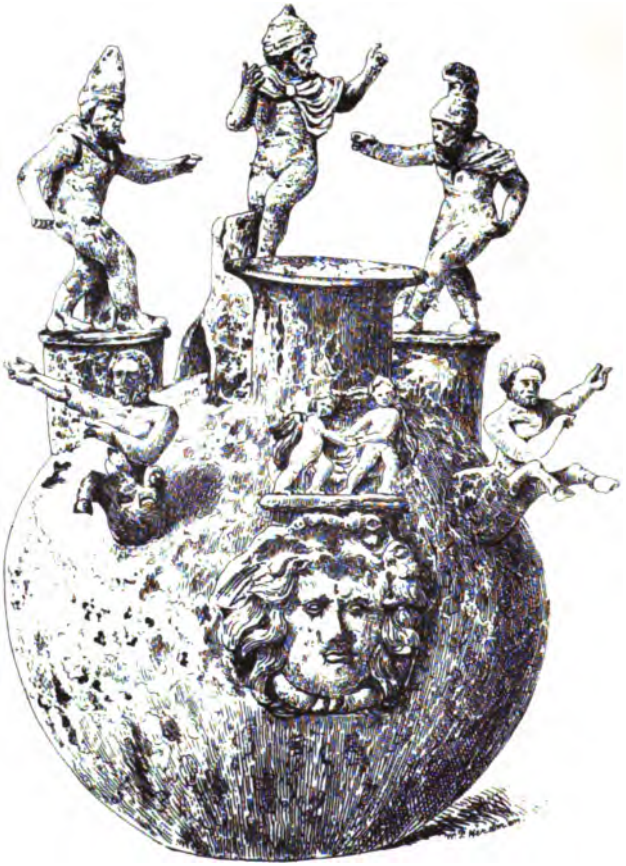
sparse habitation is new—the mighty wave of public opinion which has rolled over it is new—but the most pleasing novelty is its so quickly subsiding over such an extent of surface to its true level again."

There is another interesting letter from Jefferson, in answer to the offer of a dedication, which he accepts with the modest observation that the handing to the world the testimony of his desire to do what was right, under the authority of the name of Priestley, was securing his credit with posterity. The following extract from the letter will be of more general interest. He says:—

"One passage in the paper you enclosed me must be corrected. It is the following:—'And all say that it was yourself more than any other individual that planned and established it' i e. the constitution. I was in Europe when the constitution was planned and established. On receiving it I wrote strongly to Mr. Madison, urging the want of provision for the freedom of religion, freedom of the press, trial by jury, habeas corpus, the substitution of militia for a standing army, and an express reservation to the States of all rights not specifically granted to the Union. He accordingly moved in the first session of congress for these amendments, which were agreed to and ratified by the States as they now stand. This is all the hand I had in what related to the constitution. Our predecessors made it doubtful how far even these were of any value, for the very law which endangered your personal safety, as well as that which restrained the freedom of the press, were gross violations of them. However, it is still certain that the written constitutions may be violated in moments of passion or delusion, yet they furnish a text to which those who are watchful may again rally and recall the people. They fix too for the people principles for their political creed."

The letter to which a copy of the above was annexed, dated the 31st July, 1802, is the last in the correspondence, though the death of Dr. Priestley did not take place until February, 1804.

In selecting my extracts I have had regard almost exclusively to the passages bearing upon his personal history, in which respect I cannot help thinking that these letters may furnish useful materials to some future biographer of Priestley. If I had been guided by other motives, I could perhaps have selected passages of more general interest, in which he discusses public events and the political and social condition of the people among whom he was residing. I have with more reluctance omitted passages indicative of the character of the writer, and especially several which exhibit a peculiar independence in the



UNIQUE VASE, from CANOSA,

IN THE COLLECTION OF J. MAYER, F.S.A.

language in which he asks or acknowledges a favor. On his theological and philosophical works I cannot say the correspondence throws much additional light. He constantly mentions the works from time to time published or in progress, but it seems as if he did so rather from feeling bound to give an account of his labors than as having much community of ideas with his correspondent. I have probably however said enough to describe the nature of the contents of the letters, and hope that in indicating some new materials for biography, not wholly unimportant, I have not occupied too much of your time and attention, for the bestowal of which I beg to offer you my thanks.

Description of a Unique Vase in Mr. Mayer's Museum.

By F. R. Paul Böcke, Esq.

(Read 1st February, 1855.)

In reference to the vase found at Canosa, I beg to offer the following remarks.

This vase was formerly in the possession of the Prince of Syracuse, from whose collection it was purchased and brought to England. It is of a globular form, with the head of Medusa on the front and at the back, that on the front being surmounted by a bas-relief with two cupids, which is placed against the neck of the vase. In front, a little below the neck, are two half figures of Centaurs, one on each side of the opening, and attached to the body of the vase, the top is surmounted by three figures, intended to represent a scene from a tragedy by Sophocles, who was born near Athens B. C. 495. The following is a brief description of them.

The figure to the left with the Phrygian cap on, (as on the coins of Ithaca), is Ulysses, king of Ithaca and Dulichium; that to the right wearing a helmet, is Diomedes, son of Tydeus, and king of Etolia, who Justinian says was the founder of Brundisium and Arpi. The centre figure is that of Dolon, son of Eumedes, a Trojan. The historical portion of the scene is during the Trojan war, and is as follows:—Dolon was sent by

Hector, during the night, to spy the Grecian camp, for which service, if it proved successful, he was promised the horses of Achilles; but he was taken by Ulysses and Diomedes, to whom he instantly disclosed the plans of his countrymen, and at the same time offered a large sum of money for the preservation of his life. They were not, however, induced to accede to his request, but punished his infidelity and treachery with death.

The figures are most admirably and spiritedly modelled, and shew very great artistic skill. There is much action and life in all three, representing, as the subject does, the peculiar feelings which animate them,—Dolon hearing the approach of some one whom he cannot see, while Ulysses and Diomedes, gliding noiselessly along, are anxiously watching to secure their prisoner.

The vase itself is nearly eighteen inches high; and with the figures, measures altogether about thirty-two inches. It is in a perfect state of preservation, and is a very fine specimen of the early Grecian art in terra-cotta. It has been formerly painted with various colours, which in many parts are still remaining. It was found in a grave at Canosa, and the probability seems to be that it was presented to some celebrated warrior or tragedian. Alike, both for its historical and artistic merit, it is perfectly unique; as no similar specimen exists in any museum in Europe.

A Morning's Ramble in 'Old Warrington.'

By James Kendrick, M.D.

(Read 1st February, 1855.)

Hundreds of years ago, the town of Warrington, in Lancashire, was designated and known as '*Old Warrington*,' and although this venerable appellation has fallen into disuse in later times, I see no harm in reviving it, for this evening at least, as a catch-word in the title of my paper, the chief interest of which will lie in its being a record of *vestigia* within its limits, as yet little altered, but still fast fading away. Had our ancestors of the sixteenth century possessed a knowledge of the remains, Saxon, Roman, and early British, which have of late years been here disinterred, we should probably read of it as 'Ancient Warrington,' a title both appropriate

and well deserved. But I prefer to use the term 'Old Warrington,' since it is not to its ancient history that my present remarks have reference, nor even to the eventful passages of which it was the scene during the Civil War, but simply to a space of twenty-five years in the latter part of the past century, namely, from 1757 to 1782, in which Warrington was, next to the metropolis, the great *focus* of the masters of science and elegant literature.

On the 23rd of October, 1757, the well known Warrington Academy was opened for the education of ministers to officiate in the pulpits of protestant dissenters, and of young laymen of the like persuasion. That neither pains nor expense were wanting in this effort to supply the dissenting body with a system of education, little if at all, inferior to that afforded by the English universities, is evidenced by the men of mark who were selected as tutors, and by the station in science and literature which was acquired in after life by many of the *alumni* of the Academy. Amongst the former the learned Dr. John Taylor, of Norwich, author of the "Hebrew Concordance to the Bible," was selected as professor of divinity, and had as a coadjutor, and subsequently as a successor, the first Dr. Aikin, who brought with him to Warrington his world-renowned son, and his daughter who afterwards became Mrs. Barbauld. No less eminent, and proudly illustrative of the high-toned literary society which then existed at Warrington, are the names of Priestley, Clayton, Enfield, Seddon, Reinhold Forster, and Gilbert Wakefield, who were almost simultaneously resident here as tutors in the Academy. Amongst the students who acquired at Warrington the education which afterwards fitted them for a high position in the historic literature of their country, we may select the names of Philip Taylor, Dr. Rigby of Norwich, Dr. Percival, Dr. Bostock, Rochemont Barbauld, Dr. Parry of Cirencester, Pendlebury Houghton, Markham Salisbury, Malthus, and the Wedgwoods. "Warrington Academy," says Miss Lucy Aikin (herself a native of Warrington), in the Memoir of Mrs. Barbauld prefixed to her works, "included among its tutors names eminent both in science and in literature; with several of these, and especially with Dr. Priestley and Dr. Enfield, and their families, she formed sincere and lasting friendships. The elder and more accomplished among the students composed an agreeable part of the same society; and its animation was increased by a mixture of young ladies, either residents in

the town or occasional visitors, several of whom were equally distinguished for personal charms, for amiable manners, and cultivated minds. The rising institution, which flourished for several years in high reputation, diffused a classic air over all connected with it. Miss Aikin, as was natural, took a warm interest in its success; and no academic has ever celebrated his *alma mater* in nobler strains, or with a more filial affection, than she has manifested in that portion of her early and beautiful poem '*The Invitation*,' where her theme is this 'nursery of men for future years.'"

In testimony of the brilliant charms of the female society which then enlivened Warrington, Mrs. Barbauld (then Miss Aikin), writes from thence in January, 1772, to her friend Miss Belsham:—"I heard not long ago a piece of news which pleases me beyond measure; can you guess what it is? Mrs. Lewin tells me that my dear Betsy * intends coming to Lancashire soon. I hope these her good intentions will speedily be put in execution; if we had you here, Patty † and I should be as happy as the day is long. We have a knot of lasses just after your own heart—as merry, blithe, and gay as you would wish them, and very smart and clever—two of them are the Miss Rigbys. We have a West Indian family, too, that I think you would like; a young couple who seem intended by nature for nothing but mirth, frolic, and gaiety. I say nothing of our young men, as I would not flatter you with the hopes of any conquest, for the foresaid damsels have left us no hearts to conquer."

Add to the above that the philanthropist Howard had a prolonged residence at Warrington during this intellectual era, whilst Pennant, the naturalist, and your own Roscoe and Dr. James Currie were frequent and delighted visitors. It was at Warrington, under Dr. Aikin's tuition, that Mr. Roscoe's taste for *botany* was first aroused, and he thus writes to Miss Aikin in allusion to his attachment to her recently deceased father:—"My long acquaintance with Dr. Aikin is indeed connected with the most pleasing recollections. From having accompanied him to his little botanical garden in the vicinity of Warrington, I first imbibed a relish for those pursuits, and I well remember that, on his recommendation, I was first led to the perusal of the modern writers of Latin poetry, which has since afforded me an inexhaustible source of pleasure."

There are spots still remaining in Warrington which we look upon as

* Miss Belsham. † Her sister in-law, Mrs. Aikin.

hallowed by their association with names like these, and a desire that they may long remain so has been my chief inducement to undertake the illustration of the palmy days of the Warrington Academy, by pointing out these *vestigia*, which however little they may now interest the every-day world, were cherished to the last by our fathers with an ardour to which we, who are hurrying on through life at the fearful speed of the railway, are almost wholly strangers.

In a letter with which I was honored by Mr. Arthur Aikin, who was born at Warrington, and who died in London in April last, he says, in acknowledgment of a few memorials of Warrington, "To me, who have overpassed my eightieth year, the end of life, rather than its beginning, is the subject of habitual contemplation: my dearest affections are buried in the graves of those with whom I began the journey of life; yet I thank you, Sir, very sincerely for your present, and the perusal of it has led me back very agreeably to the morning of existence, the day-spring of hope, unchastized by experience."

Such feelings of attachment are likewise beautifully expressed by Mrs. Barbauld, "*Our Poetess*," in her epistle to Dr. Enfield, on his revisiting Warrington in 1789.

"O when thy feet retrace that western shore,
Where Mersey winds his waters to the main,
When thy fond eyes familiar haunts explore,
And paths well nigh effac'd are tracked again;
Will not thy heart with mixed emotions thrill,
As scenes succeeding scenes arise to view?
While joy or sorrow past alike shall fill
Thy glistening eyes with feeling's tender dew.
* * * * *
Were it, like thine, my lot once more to tread
Plains now but seen in distant perspective,
With that soft hue, that dubious gloom o'erspread,
That tender tint which only time can give;
How would it open every secret cell
Where cherished thought and fond remembrance sleep!
How many a tale each conscious step would tell;
How many a parted friend these eyes would weep."

Then in allusion to her father's death and burial at Warrington, she thus pathetically concludes:—

"But O the chief!—If in thy feeling breast
The tender charities of life reside,
If there domestic love have built her nest,
And thy fond heart a parent's cares divide;
Go seek the turf where worth, where wisdom lies,
Wisdom and worth, ah, never to return!
There, kneeling, weep my tears, and breathe my sighs
A daughter's sorrows o'er her father's urn!"

During the last fifty years the population of Warrington has greatly increased, and the town itself has been correspondingly extended, but it is fortunate for my present purpose (that of illustrating the precincts of the academy, and the abodes of its tutors), that these localities remain almost unaltered to the present time. Fifty years more will inevitably produce a great change, and should my weak effort to perpetuate these *vestigia* endure so long, it may, perhaps, thereby acquire additional value, as an humble effort to preserve even traces of the footsteps of those whose names will ever be held dear, so long as the beauties of true poetry and elegant literature are cultivated and admired.

We already possess the general biography of these 'Warrington Worthies' from the pen of Dr. Aikin, of his daughter Lucy Aikin, who is still living in the neighbourhood of London, or of other near friends, and in one instance, that of Dr. Priestley, by himself. In the 8th, 9th, and 10th volumes of the *Monthly Repository of Theology, &c.*, the history of the Warrington Academy, and of its tutors, together with a list of the students, forms a very interesting series of communications from the pen of the Rev. William Turner, now resident in Manchester, who at the patriarchal age of ninety-two is the sole survivor of the *alumni* of the Warrington Academy. With these ample sources of reference, I may be excused omitting any lengthened biographical notices, and a few brief observations as we pass along will be sufficient to identify these 'men of mark' with the different spots to which it is my intention to conduct my hearers.

Regarding my friends as visitors for the first time to the town, I shall make the Warrington station of the London and North Western Railway the starting point of our morning's ramble, and proceeding thence about 350 yards towards the centre of the town, I would direct their attention to a plain but substantial house in Sankey street, fronting to the end of Golborne street, which on the 29th of September, 1740, was the birth-place of the estimable *Dr. Thomas Percival.* Within the last few years the front of this house has been overlaid with stucco, but I am fortunate in possessing a sketch of its original appearance by the kindness of Mr. Thomas Thompson, of Liverpool, who feels an additional interest in the house, from its being for some years the residence of *Samuel Fothergill*, a faithful and highly-gifted minister in the Society of Friends, whose letters have been edited, with a memoir prefixed, by the late Mr. George Crosfield, of

this town. Until Dr. Percival's permanent removal to Manchester, his childhood and youth were spent here, his name being the first enrolled in the list of the students of the *Academy*, 20th October, 1757. A few years were spent at Edinburgh whilst taking his degree in Medicine, and in 1767 he commenced that career in Manchester which earned for him, before all others of his day, the character of an accomplished and conscientious physician. "In a few words," says Dr. Magee, "he was an author without vanity, a philosopher without pride, a scholar without pedantry, and a christian without guile. Affable in his manners, courteous in his conversation, dignified in his deportment, cheerful in his temper, warm in his affections, steady in his friendships, mild in his resentments, and unshaken in his principles; the grand object of his life was usefulness, and the grand spring of all his actions was religion."

The house we are now regarding, and much of the adjoining property, were then held by the father of Dr. Percival under a lease from the Legh family, and until a comparatively few years a large extent of this ground, let as gardens to the public, was known as Percival's Orchard, and a narrow lane, now supplanted by the present Bold street, was known as Percival's or Pewcill's lane. It is to be regretted that this venerated name has been annihilated in the course of modern improvements, and the only connection of this great and good man with the place of his birth which now remains to us, is a small court in a different part of the town, known as Percival's Fold. Here the descendants of Dr. Percival still retain some property, but it is to be hoped that ere long we may see his name affixed to a locality more worthy of him.

Leaving now the birth-place of Dr. Percival, we turn to the right into Bold street, and following its course are led to the well-known Warrington Bridge, which as the only pass over the Mersey in former times, except by ford or ferry, was always considered the key of the two counties palatine. But without crossing it, we are here, on this occasion, to contemplate a plain and sombre mansion at its Lancashire extremity, for this was the building selected by the dissenting body for the commencement of the *Academy* in 1757. "In the course of the summer of this year," says the Rev. William Turner, "the committee were busily employed in making arrangements for obtaining suitable accommodations for the several tutors, and a public hall, library and class room, with a view to the commencement

of the first session, early in the autumn of the same year. Accordingly, a range of buildings at the north-west end of the bridge was engaged, to which was attached a considerable extent of garden ground, and a handsome terrace-walk, on the banks of the Mersey; possessing, altogether, a respectable collegiate appearance. Here the academy continued for several years." Mrs. Barbauld, in her poem of the 'Invitation,' makes allusion to this building:—

> "Mark where its simple front yon mansion rears,
> The nursery of men for future years!
> Here callow chiefs and embryo statesmen lie,
> And unfledged poets short excursions try;
> While Mersey's gentle current, which too long
> By fame neglected and unknown to song,
> Between his rushy banks—no poet's theme—
> Had crept inglorious like a vulgar stream,
> Reflects th' ascending seats with conscious pride,
> And dares to emulate a classic tide."

The garden behind this house had, a few years since, a good specimen of the substantial alcove or summer house, which was much in vogue at Warrington during the 18th century, as would appear from the number yet remaining, though mostly in a dilapidated state. They are all square brick buildings, with flattened roofs, raised upon arches, and reached by a flight of stone steps on the outside. Whilst the space beneath the arches is occupied by a seat and rustic table, the upper room is generally well finished with a moulded ceiling and cornice, fireplace and mantlepiece, having also two or more well made sashed windows. They were evidently intended for the entertainment of a small and select party, where visitors of the gentler sex were present, if not predominating.

Leaving now this interesting old house and garden, we are to proceed up Bridge Street towards the centre of the town, passing on our way, opposite the Royal Oak tavern, the humble dwelling of *John Macgowan*, author of "Dialogues of Devils," "The Shaver," "The Canker Worm," and numerous controversial works. He was resident here for some years, exercising the business of a bread baker, and on Sundays officiating as minister at the ancient chapel of the Baptists, at Hill-cliff, near Warrington.

Proceeding onwards in our course up Bridge Street, we pass the temporary residence of one whom nations have combined to honour, the philanthropist *Howard*. It is a large house nearly opposite to the gateway of the Eagle and Child Inn, and has been newly fronted

within comparatively few years. The tenant with whom Howard lodged was a Mrs. Wilde, silversmith, but the house has at the present time no occupant, having been very lately left by Mr. Joseph Chrimes, cooper. Here the philanthropist lodged for some months during the early part of the year 1777, whilst his first publication, and that which raised him a fame throughout Europe, "The State of the Prisons in England and Wales" was going through *Mr. Eyres's* press at Warrington. In a letter from *Dr. Aikin* to *Mrs. Barbauld*, dated in February, 1777, is the following passage:—"We have a work now in Eyres's press which will, I think, establish the reputation of its author as the *best man*, if not the most elegant writer, in England. It is the benevolent Mr. Howard's account of Prisons, a subject which he has for some years pursued with a spirit and assiduity that looks scarcely of a piece with anything else to be met with in this degenerate age. Nothing but his book can give a proper idea of the dangers and fatigues he has gone through in his truly patriotic design. He has been here, superintending the printing, for three or four weeks, and will stay as much longer. I have the pleasure of seeing him every day, being his corrector and reviser, and so forth." I will quote, too, a passage from Howard's biographer, Mr. Brown, which is interesting from its minuteness of detail respecting the daily routine of his life whilst at Warrington. "To second, to the utmost of his power, the laudable anxiety which Mr. Howard felt to render his work as free from faults as possible, Mr. Eyres selected one of his compositors, on whom he could place the greatest dependence, to devote his whole time to it, and to receive from the author himself such directions as he should think proper to give as to the mode in which he would have it printed, and the alterations he might make as it passed through the press. For the purpose of being near the scene of his labours in superintending the progress of his work, he took lodgings in a house close to his printer's shop; and so indefatigable was he in his attention to the business which had fixed his temporary abode there, that during a very severe winter he was always called up by two in the morning, though he did not retire to rest till ten, and sometimes half after ten at night. His reason for this early rising was, that he found the morning the stillest part of the day, and that in which he was the least disturbed in his work of revising the sheets as they came from the press, either before they were submitted to the inspection of Dr. Aikin, or after they had undergone his revision, lest some little typographical error might have

escaped his notice. At seven he regularly dressed for the day, and had his breakfast; when punctually at eight he repaired to the printing office, and remained there until the workmen went to dinner at one, when he returned to his lodgings, and putting some bread and raisins, or other dried fruit, in his pocket, generally took a walk in the outskirts of the town during the time of their absence, eating, as he walked along, his hermit fare, which, with a glass of water on his return, was the only dinner he ever took. Sometimes he would call in upon a friend in his way, though the acquaintance he formed in this town was not very numerous, consisting principally of a few members of the society of Friends, to whose habits and manners he was at all times attached, and some of the literary men of unitarian sentiments, whom the academy for training young men to the ministry in that denomination had attracted there. With persons of his own religious views he had but little opportunity of associating, the Calvinistic Independent interest there being even lower at that period than it is in the present day. With some few of this persuasion he did, however, occasionally mingle in the social intercourse of private life, as well as in the services of the sanctuary, which he regularly attended in their humble place of worship. When he had returned to the printing office, he generally remained there until the men left work, and then, I am informed, repaired to Mr. Aikin's house, to go through with him any sheets which might have been composed during the day, or, if there were nothing upon which he wished to consult him, would either spend an hour with some other friend, or return to his own lodgings, where he took his tea or coffee in lieu of supper, and at his usual hour retired to bed."

Many other interesting particulars of Mr. Howard's daily routine of life are given by Mr. Brown as witnessed at Warrington, for besides his first visit in 1777, he was resident here, and on each occasion for some months, in the years 1779, 1783, and for the last time in 1789, when his work "On the Principal Lazarettos in Europe" was printed by Mr. Eyres. It is only a few years since James Roby, the careful compositor above referred to, died at the age of 64 years, and he, too, was always eloquent in the praise of Mr. Howard's general benevolence and liberality to himself and his fellow-workmen. A medal of the philanthropist was fastened to his printing press, and was only taken down when the old man left the office he had served so long, for the sick bed from which he never again returned. There are still several memorials of Howard remaining at Warrington, in the form of trifling presents to his friends, and I believe that no other town

ever will or can exceed ours in the veneration and esteem with which his memory is retained.

Proceeding onwards for a short distance, in the course described by Dr. Aikin and Mr. Brown as the daily footsteps of the philanthropist, we are brought to the site of *Mr. Eyres's Press*. The whole of the picturesque front has, however, long been removed, and the interior much altered; but its most serious injury was sustained in December, 1843, by a disastrous fire, which broke out in the upper story of the building, consuming a large amount of manuscripts and corrected proofs, which had been carefully preserved since the commencement of Mr. Eyres's business as a printer. The interest of this curious store, and its irreparable loss, will be understood when I state that from this printing-office issued the original editions of works by the Aikins, Mrs. Barbauld, Dr. Enfield, Priestley, Roscoe, Currie, Percival, Gilbert Wakefield, Ferriar, John Howard, Pennant, and Watson's 'History of the House of Warren,' the last of which is designated by Gilbert Wakefield as "perhaps the most accurate specimen of *typography* ever produced by any press." The first newspaper published within the county of Lancaster issued from Mr. Eyres's printing-office at Warrington, and amongst the injured relics of the disastrous fire to which I have alluded, was found one of the original wood-cuts affixed to the 'Warrington Advertiser.' Although much curtailed of its original dimensions, the Historic Society honored me by making use of it in the fifth volume of their transactions.

At this point of our 'Ramble' we turn to the right hand down the Butter-Market Street, passing in our way to the Academy the house occupied by *Dr. Taylor*, the author of the 'Hebrew Concordance to the Bible,' who was alluded to at the outset of my paper as the first elected tutor and *president* of the Academy. It is situated opposite to the end of Bank Street, but being now divided into two tenements, one of which is occupied as a flour warehouse, presents little trace of its original appearance.

Proceeding onwards down the Butter-Market Street, the second turning to the right brings us into the classic precincts of the *Academy*, and the noise and bustle which we at once leave behind us, is singlarly contrasted with the almost cloistered stillness which here prevails. No rumbling dray, nor rattling omnibus obtrudes itself here, nor does the crowd of hungry artizans, visible in every manufacturing town at the dinner-hour,

make this a thoroughfare to their homes. Originally destined for the quiet seat of instruction, the chief literary and scientific institutions of Warrington have here found an appropriate home. The main building of the Academy accommodates, on its ground floor, a prosperous School of Art, whilst the upper stories are tenanted by the Warrington Church Institute. The left wing of the court is occupied by the Mechanics' Institution, and although the right wing is held by private individuals, it is occupied as a seminary for the education of young ladies. At one time, it is true, the large rooms of the Academy were made use of as a storehouse for sail-cloth, and for manufactured cotton goods, a desecration of her beloved resort which is alluded to by Mrs. Barbauld in her Epistle to Dr. Enfield, on his revisiting Warrington in 1789. The beauty of these few verses demands that I should quote them here, although the opprobrium she deplores no longer exists, and although it is also to be feared that the "learned echoes" and the "Castalian dews", of which she sings, have disappeared, never to return.

"Lo there the seats where science loved to dwell,
Where liberty her ardent spirit breathed;
While each glad Naiad from her secret cell,
Her native sedge with classic honours wreathed.
O seats beloved in vain! your rising dome,
With what fond joy my youthful eyes surveyed;
Pleased by your sacred springs to find my home,
And tune my lyre beneath your growing shade!
Does desolation spread his gloomy veil,
Your grass-grown courts and silent halls along?
Or busy hands there pile the cumbrous sail,
And trade's harsh din succeed the muse's song?
Yet still, perhaps, in some sequestered walk,
Thine ear shall catch the tale of other times;
Still in faint sounds the learned echoes talk,
Where unprofaned as yet by vulgar chimes.
Do not the deeply-wounded trees still bear,
The dear memorial of some infant flame?
And murmuring sounds yet fill the hallowed air,
Once vocal to the youthful poet's fame?
For where her sacred step impressed the muse,
She left a long perfume through all the bowers;
Still may'st thou gather thence Castalian dews,
In honeyed sweetness clinging to the flowers."

The *Academy* itself, erected in 1762, as more convenient for the purposes of the Institution, is a plain three-story building, the lowest room of which was used as the common-hall and library, whilst the two upper stories were devoted to class-rooms. I presume that the lower story was also the dining room of the students, as the commons were provided by a

regularly appointed purveyor. Each student had a separate room assigned to him in a range of buildings erected in 1767 on the west side of the quadrangle, and a general servant or "scout" was found in the person of *Peter Cropper*, who died in Warrington a few years since, at a very advanced age. He was the veritable Joseph, in Dr. Aikin's amusing *Farm-Yard Journal*, written for the '*Evenings at Home*,' and the terror of poor Joseph at the supposed ghost is but the humourous description of Peter Cropper's fright at a mischievous device of some few of the students. Passing through a door-way at the end of the building we enter a small garden belonging to the Institution, and it is not unlikely that this is the precise spot where Mr. Roscoe first imbibed from Dr. Aikin his taste for the study of botany.

The large house on the west side of the Academy Court, was the residence assigned in the first instance to *Mr. John Holt*, Dr. Taylor's coadjutor, and tutor in *mathematics* and *natural philosophy* in the Academy, and at his decease in 1772 it was occupied by *Dr. John Reinhold Forster*, the naturalist, who accompanied Captain Cook in his second voyage round the world. He held, for a few years only, the chairs of *natural history* and *modern languages* in our Academy, and whilst resident here, acquired the friendship of *Mrs. Anne Blackburne* of Warrington, a celebrated naturalist, the friend and correspondent of Linnæus, who named after her one of the American Warblers, *(Sylvia Blackburniæ.)* Dr. Forster also named in her honour a genus of New Holland plants, *(Blackburnia.)* On his departure from Warrington the house we are considering was occupied by the celebrated *Dr. Enfield*, who came to the institution as tutor in *belles lettres* in 1770, and resided here for two years after the dissolution of the Academy in 1783.

The house opposite, was from the period of its erection to 1767, the residence of the celebrated *Dr. Priestley*. A small two-story house behind it was used by him as a laboratory for chemical and electrical experiments, and it is not improbable that he here made his earliest discoveries of the nature of oxygen, carbonic and nitrous oxides, and other gases not previously known. Mrs. Barbauld has given us an amusing poetical description of this little *sanctum* in her *Inventory of the Furniture in Dr. Priestley's Study*, for as such he appears to have used it, as well as a laboratory. The whole is too long to quote here, but a few lines will impart character to my present notice of it.

"A map of every country known,
With not a foot of land his own.
A list of folks that kicked a dust
On this poor globe, from Ptol. the First;
He hopes,—indeed it is but fair,—
Some day to get a corner there.
A group of all the British kings,
Fair emblem! on a packthread swings.
The Fathers, ranged in goodly row,
A decent, venerable show,
Writ a great while ago, they tell us,
And many an inch o'ertop their fellows.
A Juvenal to hunt for mottoes;
And Ovid's tales of nymphs and grottos,
The meek-rob'd lawyers, all in white;
Pure as the lamb,—at least to sight.
A shelf of bottles, jar and phial,
By which the rogues he can defy all,—
All filled with lightning keen and genuine,
And many a little imp he'll pen you in;
Which, like Le Sage's sprite, let out,
Among the neighbours makes a rout;
Brings down the lightning on their houses,
And kills their geese, and frights their spouses."

It was here, too, (I mean in this humble building,) that Mrs. Barbauld penned her charming poem, *The Mouse's Petition*, the elegance of feeling of which has enshrined it in the memory of our early school-days. She was then Miss Aikin, and with the freedom of intercourse which her affection for Dr. Priestley's family induced, had made her way one morning into the vacant study of the philosopher, and finding the little animal, which she immortalized by her verses, imprisoned in a trap, for the purpose of being experimented upon, and of course killed in the trial, she wiled away the interval of Dr. Priestley's absence by the composition of this short but beautiful poem. I shall not quote it here, for the verses have become household words.

Leaving the quiet quadrangle of the Academy, which was once closed by a handsome iron gateway and railing, we turn for a short distance further down the Butter-Market Street, for here, directly opposite to the Dispensary, is the house formerly occupied by the talented family of the *Aikins*. When the first *Dr. Aikin* came to Warrington in 1758, his daughter, subsequently *Mrs. Barbauld*, was fifteen years of age, and this house was her beloved home until 1774, a period of sixteen years, when she married the Rev. Rochemont Barbauld, and removed to Palgrave, in Suffolk. "The years passed by her at Warrington," says her biographer, Miss Lucy Aikin, "comprehended perhaps the happiest, as well as the most brilliant

portion of her existence." Here were written her earliest Poems, from which I have quoted largely, and from them all we may gather with what emotions she would recur to this scene of her early affections and friendships. The house we are regarding was of course the home of her brother also, *Dr. John Aikin*, who was only eleven years of age when he came to Warrington, and his daughter in his biography at this period says, that "he was immediately entered among the students, and attended the lectures of his father and the other tutors. Three diligent years passed in this situation, enabled him to add a considerable superstructure of various knowledge to the firm grammatical foundation previously laid at Kibworth, and what was of still more importance, imbued him indelibly with that love of letters which became at once the ornament and safeguard of his youth, and the occupation and solace of every succeeding period of his life." For some subsequent years he was mostly absent in Scotland, London, Manchester, and elsewhere, engaged in the study of the medical profession, of which he commenced the actual practice at Chester in 1770, but quitted it for Warrington in the year following. His career as a literary writer commenced immediately, and all his early productions, like those of his sister, were printed at Warrington by Mr. Eyres. His success in the medical profession, during his residence of thirteen years at Warrington, was good, but still below his expectations, and in 1784 he left this town for Yarmouth, but eventually settled in London. "Notwithstanding the circumstances," says Miss Lucy Aikin, "which had rendered him justly dissatisfied with his professional situation at Warrington, his feelings on the near prospect of departure made him sensible, that in the way of social and friendly enjoyment he had many sacrifices to make in quitting that county which had extended so affectionate an adoption to his parents, his sister, and himself; and which was the scene of all the dearest recollections of his youth, and the birthplace of his children." These children who were born to him in Warrington were—1. *Arthur*, who was for many years Secretary to the Society of Arts, and Lecturer on Chemistry at Guy's Hospital. 2. *Charles Rochemont*, the author of a "Dictionary of Chemistry and Mineralogy," who settled as a medical practitioner in London, and married the daughter of Gilbert Wakefield. 3. *Edmund*, a well-known architect in Liverpool. And 4. *Lucy*, the authoress and biographer, who is now the sole surviving child. There are, perhaps, few private residences which can boast of such a constellation of talent and worth combined in

one family under one roof, and I therefore look upon the residence of Dr. Aikin in Warrington as a spot attended with our most pleasing and refined associations.

There is yet one other shrine included in my purpose of illustrating the *vestigia* of the Warrington Academy, to which I would fain direct a visitor, the house of *Gilbert Wakefield*, in Bewsey Street, were it not for the intricacy of the route, and the alterations which it has undergone from its original appearance. But this is of less importance, since his name is always linked with that of Dr. Aikin by the bonds of that long abiding friendship which commenced at Warrington, and was cemented by still dearer ties. Mr. Wakefield came to Warrington, 1779, as *classical* tutor in the academy, and remained here until its close in 1783. In his personal memoirs, written some years afterwards, he says, "I reflect to this day, with a pensive pleasure, saddened by regret, on the delightful converse,

"That flow of reason, and that feast of soul,"

which I enjoyed at Warrington with my colleagues; especially at a weekly meeting, holden alternately at the house of each other, and rendered still more agreeable by the occasional accession of some congenial spirit, resident on the spot, or casually introduced as a visitor:

"While summer suns roll unperceived away."

So far as I know we have now visited each spot which can be safely identified with the *Warrington Academy* and its tutors. I feel that the remarks which I have made have done their subject but scanty justice, and yet I am not without an emotion of fear that I have assigned to it an interest which exists only in my own "*amor loci*." But without such a feeling it is not likely that any of our local annals will be long preserved. Not that we can use these annals as a matter for boasting, but rather as a salutary proof of our own littleness, for if we compare the present intellectual condition of Warrington with that of the era of its Academy, we cannot deny, but are bound to confess, that "there were giants in those days."

True it is, that all these 'Worthies' were members of other communions than my own; but advocate as I am for the lasting union of our church and state, I can yet live in harmony with those who have been led to think differently. The reign of bigotry and prejudice has passed away, and we are now free to admire the possessors of character and talent, however much they may differ from us in politics or religion.

Notices of British Antiquities—No. 2. Objects in Glass.

By Edward Benn, Esq.

(Read 4th January, 1855.)

In my paper, No. 1, on British Antiquities* an opinion was expressed, founded on observation made upon the circumstances under which the various objects of a remote period were found in Ireland, that articles of stone were more recent than those of bronze, iron, and glass, which many suppose to be quite modern in comparison. As a farther illustration of this matter, nothing is more surprising than the accounts I have frequently received of the discovery of glass beads. These articles are found under such circumstances as would lead one to infer that they belonged to an age so distant as to seem quite incredible;—in those localities, indeed, in which are discovered those great fossil teeth, said to have been of an extinct horse. These extraordinary teeth are scattered over the county of Antrim, for instance, in considerable numbers, and their history and origin are to me quite inexplicable. I do not mean to assert that the teeth have been found in absolute connection with the beads, but both have been discovered at the same depth in the subsoil and in the alluvial soil, as I have taken pains to ascertain. Some of these beads exhibit a considerable degree of skill, but indeed to make glass of any kind proves that a people have advanced far beyond the savage state. The question is, were these beads fabricated in Ireland? That some of them were, we must believe, till it is shewn that similar productions are met with in other countries, and many of them are so remarkable and have such a curious appearance, that if discovered in the ground elsewhere, the circumstance would, it is most probable, be generally known. Till such shall prove the fact they must, therefore, be classed as Irish.

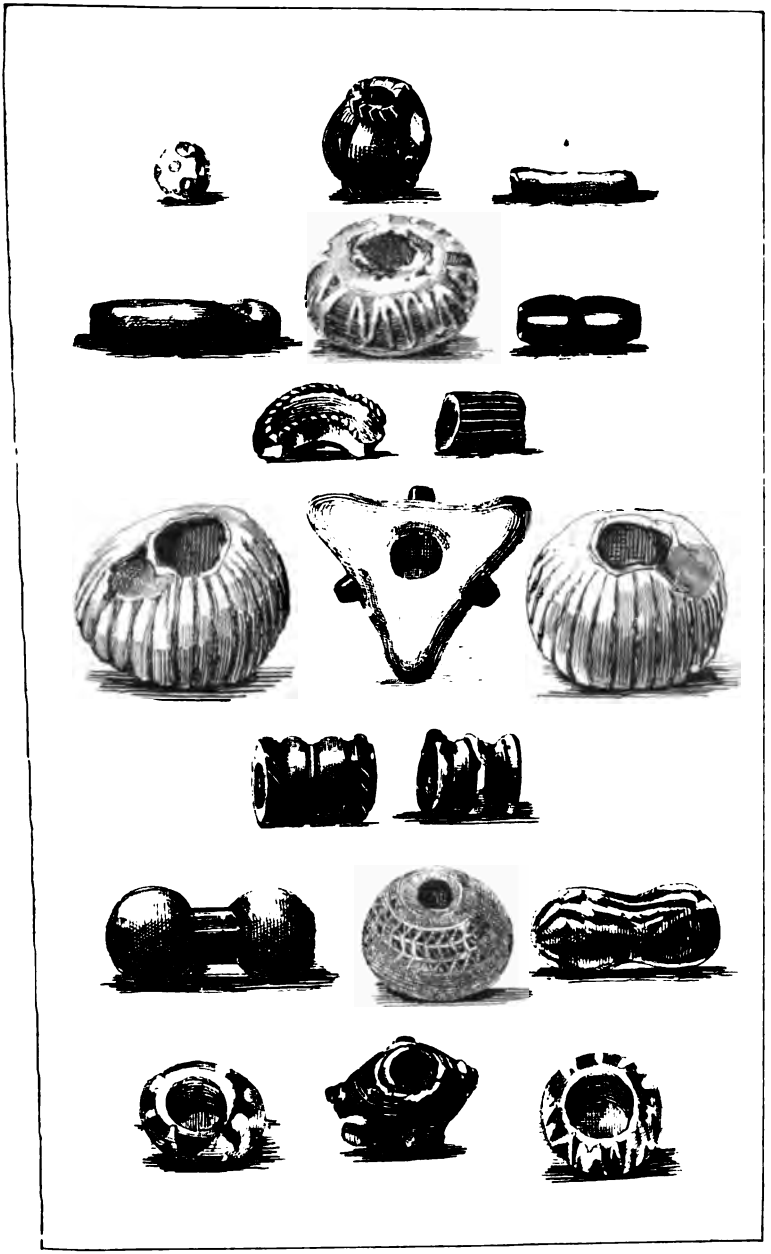
There is, however, it must be confessed, a great liability to error in an inquiry of this kind. We know that beads have been used at the most remote period, and that they are also in use at the present day; and it therefore requires much caution in assigning a great age to what may be found comparatively modern. Keeping this fact in view, therefore, I will confine myself to descriptions and exhibitions of beads actually found in the earth in a given locality, hoping that those who are

* Volume vi. p. 102.

in possession of facts confirming what is stated or otherwise, will make their information known, as it is only by such co-operation that the truth can be reached, and it is also highly important to compare the productions of one locality with those of another.

With these preliminary observations I exhibit a bead, No. 1, which is not glass, nor of British manufacture. It is found commonly in Antrim, under circumstances corresponding with those of the other beads referred to; also in England, and I believe generally over the Continent. A necklace of beads of this kind was discovered, I think, in making the foundation for London Bridge, in connection with Roman remains as old as about the commencement of our era. We will not probably err in assigning to them, therefore, an age of about 2000 years. They are of Terra Cotta and have been of a beautiful ultramarine colour. I have never seen them of any other colour, except one, which was a brilliant carmine red, and which was found four feet deep in alluvial soil near Belfast. These beads were of different sizes. That which I exhibit is very large and was probably the centre of the necklace, being gradually smaller as they receded to each extremity. If I am rightly informed, what I may call Irish beads have been found, indicating, from their depth in the ground or otherwise, a much higher degree of antiquity than the red one to which I have referred.

There is a remarkable circumstance connected with the foreign beads. Their form is what the world calls graceful or classic, their type being an orange or melon. The colours have also been very beautiful, but they have not stood the test of time, as it is only from remaining spots we can judge of their original brightness, nor have I ever seen any attempt at variety of form. On the other hand, those which I consider to be British have such variety of form and ornament that it is difficult to find two of the same pattern. There is scarcely any shape that a bead could be made to assume, of which examples could not be found among them. There are also a great many shades of colour; dark blue, however, is the most prevalent; they are generally not brilliant, but seem to be extremely durable, and having retained their original appearance for so many centuries, we might almost conclude them to be indestructible by the agency of time alone. Does this singular difference between the Continental and British workman in glass appear to have continued almost to our own time? When I call these beads "glass" I do so on good authority, though some of them are so opaque as to transmit



BEADS FOUND IN IRELAND.

no light. When held before the flame of a candle several of them prove a considerable amount of chemical knowledge, as when three or four colours are put on, one over the other, each fusing at a different temperature. Much skill also must have been employed in manipulating the glass, in those cases in which very fine strings or threads have been introduced.

A very difficult part of this inquiry is now reached. In paper No. 1 I stated that what are called celts of stone and bronze, one a fac-simile of the other,* had been found, and the question was to determine whether the stone had been made in imitation of the brass, or had preceded it. The same difficulty arises in our present inquiry. Beads of stone are frequently found which seem no older, so far as can be judged from the circumstances connected with their discovery, than those of glass. Were these the originals of the new handsome bead? I think not. They were more probably the ornaments of persons too poor to procure the more costly material. This of course is only an opinion for which I have no reason to offer.

On the Materials for the History of the two Counties, and the mode of using them,—Part II.

By John Robson, Esq.

(Read 29th March, 1855.)

In the paper which I had the honor of reading to the Society two years ago, on the Materials for the History of the two Counties,† we came down to the commencement of the fifth century, and I ventured to express an opinion that there was no real ground for the common belief that the inhabitants of Lancashire and Cheshire had been at any time Welsh or Celtic; that in fact the Celtic tribes, at the earliest historic period, were confined to the western parts of the island; that the extent of their dominions may be traced by the Celtic names of places, both in Wales and Cornwall; and that the rest of England was occupied by a Teutonic race, as it is at the present time. We have now to ascertain how far our subsequent materials confirm or invalidate this statement, and whether in following out the tracks left us, few and indistinct enough, we may not get a more trustworthy survey than we had before.

* See also Volume v. p. 129. † Volume v. p. 199.

It may be right to say, that I use the words *Britanni, Picti, Saxones,* and others taken from the Latin writers, in the original language. By the *Sexna* I mean the inhabitants of the south-eastern part of the island, including Kent, Essex, Middlesex, Sussex, and the old kingdom of Wessex, the Litus Saxonicum of the Roman Empire; and by the *English*, the rest of England, excluding of course the Celtic tribes already named, and including the Anglians, Mercians, Hwiccas, and Northumbrians, or as they are often called in Welsh documents Lloegrians. I must add that the history of the two counties, during the 5th, 6th, and 7th centuries, merges in the general history of the country, there being no authenticated remains, that I am aware of, and no mention of either of them in the records left to us.

In investigating the history of the two centuries following the expulsion of the Romans, important as they are to the Archæologist, the Historian, and the Legislator, we find our most able writers utterly bewildered. Mr. Kemble says, "It must not be forgotten that we have no trustworthy event of English history previous to the arrival of Augustine (A.D. 597). Whatever precedes that great epoch, by whom soever, and at what period soever related, is nothing more than tradition, and liable to all the accidents by which tradition is affected, nay, which themselves constitute tradition."* And again, "In all that these, the earliest historians of England, have left us, we have evidence of what unsatisfactory materials they had to deal with. A majority of the kings recorded in their pages are mythic heroes, common both to England and Germany; while the constant recurrence of particular numbers in the dates of their reigns, are equally convincing proofs of mythic tradition. History has nothing to do with them, they fall into the circle of mythology. Even of those who approach somewhat nearer to historical periods, little more than the names has survived; and it is often doubtful whether even those are or are not names of men; it may be fairly questioned whether we know the name and rank of Aethelberht's grandfather."† I am sure that I need say no more to bespeak your indulgence, in attempting to throw some light upon the period in question, and that you will allow me to quote a passage in a late number of the Quarterly Review, written, however, upon a totally different subject, but which seems most appropriate to our own. "Let us premise, before we plunge into the

* Kemble, Codex Diplom., vol. i, p. 5. † Ibid. p. 58.

mare magnum before us, this one 'caveat' for the reader's sake, viz., a great deal more may always be said on what we do not know than on what we do. Truth is a grain, error a mass; but the mass often encloses the precious particle, which is discovered only by him who will patiently sift it, throwing nothing aside until he is satisfied of its worthlessness."*

As far as number is concerned there is no want of works relating to this portion of our history, but unfortunately their value is very small. First we have the Welsh authorities—the bards, the triads, Nennius and Geoffrey of Monmouth; then we have Saxon Remains, and Norman Chronicles; but none of these have any authenticity for the affairs of the fifth and sixth centuries. Beda, Asser, Ethelward, are equally wanting in authority, and the only actually contemporary evidence is that of Gildas.

The influence that the Welsh writers have had on subsequent historians is very singular, and not easily understood. The Welsh themselves swallow with perfect good faith the most astounding relations, and if a statement is made in genuine Cymraeg, it is neither doubted nor doubtful. Even if we were inclined to admit the existence of such individuals as Aneurin and Taliessin, the poems which we have under their names would still be of little value, as we have no evidence that at that period the Welsh language had been reduced to writing, and the earliest manuscripts are five or six hundred years later. But more than this, in the collection edited by M. Hersart de la Villemarqué there is not a single fact recorded that can be made available for historical purposes, and the attempt to do this has utterly failed. Thus, the first poem in the collection is one said to be by Llywarch Henn, on the death of Gerent, son of Erbin. This Gerent, says the poem, was born in the glorious time of Britain, and a christian, he was the foe of the Sais or Saxons, and a friend to the saints. "At Longport I saw tumult, corpses in blood, and men red before the assault of the foe. At Longport I saw carnage, corpses in great number, and men red before the assault of Gerent." The poet had seen at Longport men who had drunk wine out of sparkling glasses, suffering want and privation after plenty: there was blood in the valleys, and a fearful conflagration. At Longport, Gerent the brave, warrior of the wooded Deuvnent, (Damnonia, Devonshire,) was slain, with the valiant soldiers of Arthur, the chief in war." Now in the Saxon chronicle we read, "501. This year Port and his two

* Quarterly Review, No. 191, p. 98.

sons, Bieda and Mægla, came to Britain with two ships, at a place which is called Portsmouth, and they soon effected a landing, and they there slew a young British man of high nobility:" and both the French editor and Sharon Turner state that the Welsh ode has reference to this very event. But it is quite evident that Longport (wherever it may be) is described as in a state of siege, and probably, for it is by no means clear, had been attacked by Gerent; neither is there anything to show that the Saxons were there at all. There is a long poem attributed to Aneurin called the Gododin, which describes the battle of Cattraeth, at which the poet was present. Where and when the encounter took place is not known, and yet it is represented as the most important of all the engagements with the Saxons.

As to the triads, as specimens I may offer the 45th and 46th, as they belong to our immediate subject, though the precise year is wanting.

"45. The three disgraceful traitors who enabled the Saxons to take the crown of the isle of Britain from the Cambrians. The first was Gwrgi Garwlwyd, who, after tasting human flesh in the court of Edelfled, the Saxon king, became so fond of it that he would eat no other but human flesh ever after. In consequence of this, he and his men united with Edelfled, king of the Saxons; and he made secret incursions upon the Cambrians, and brought a young male and female, whom he daily ate. And all the lawless men of the Cambrians flocked to him and the Saxons, where they obtained their full of prey and spoil taken from the natives of this isle. The second was Medrod, who, with his men, united with the Saxons, that he might secure the kingdom to himself, against Arthur; and in consequence of that treachery many of the Lloegrians became as Saxons. The third was Aeddan, the traitor of the north, who, with his men, made submission to the power of the Saxons, so that they might be able to support themselves by confusion and pillage, under the protection of the Saxons. On account of these three traitors, the Cambrians lost their land and their crown in Lloegria; and if it had not been for such treasons, the Saxons could not have gained the island from the Cambrians.

"46. The three bards who committed the three beneficial assassinations of the isle of Britain. The first was Gall, the son of Dysgyvedawg, who killed the two brown birds of Gwenddoleu, the son of Ceidiaw, that had a yoke of gold about them, and that daily devoured two bodies of the Cambrians for their dinner, and two for their supper. The second was Ysgavnell, the son of Dysgyvedawg, who killed Edelfled, king of Lloegria, who required every night two noble maids of the Cambrian nation, and violated them, and every morning he killed and devoured them. The third was Difedel, the son of Dysgyvedawg, who killed Gwrgi Garwlwyd, that had married Edelfled's sister, and committed treachery and murder in

conjunction with Edelfled upon the Cambrians. And this Gwrgi killed a Cambrian male and female every day and devoured them, and on the Saturday he killed two males and two females, that he might not kill on the Sunday."

I have taken this from "The Ancient Laws of Cambria, * * to which are added the Historical Triads of Britain; Translated from the Welsh by William Probert. London, 1823." The translator was certainly a man of learning, for I find in his translation that the laws, as far as I have compared them, are often in the very words of that published by government. He has a foot note upon the first triad which ought always to go with it—"This and the following triad are the only instances upon record of cannibalism in the island; and it is worthy of notice that these savages first tasted human flesh *in the Saxon court*. What shall we say to this fact?"

I am not going to say anything to Mr. Probert's fact, but see if we may not make something out of the triads. It must be remembered that a very remote antiquity indeed is claimed for most of the triads, and whether there are any referring to a later date than these two may be doubted, so that without making any question about the males and females provided for these gentlemen of prodigious appetite, and the christian scruples of the one who would not kill on Sunday, we are told that many of the Lloegrians became as Saxons; and this is a fact which we shall use hereafter.

With reference to Nennius, who is said to have lived in the eighth century, the difficulties in every form and on every side are so great, that I am sure you will excuse me occupying your time now in attempting to remove them.

How any one in these days could be taken in with Geoffrey of Monmouth is inconceivable, but as he is of a period far removed from the times which we are concerned with, we may easily and fairly put him aside. How much of his history, subsequent to the death of king Arthur, is corroborated by other evidence, has yet to be examined.

We come now to the Saxon authorities, and here again we have poems professing to belong to the fourth and fifth centuries; but even allowing their genuineness, we get nothing in the shape of history from them. There are two poems of this class more especially remarkable, BEOWULF and the TRAVELLER'S SONG. That BEOWULF in its present form is of much later date,

is proved from its repeated allusions to christianity. It exists in a single manuscript, which is said to be of the first half of the eleventh century, and we have no reason to think that a poem written then would at all represent the language spoken 500 years before. I should rather suppose that it was a selection or compilation of ballads originally composed in honour of some of the Danish chieftains who had settled in East Anglia, and handed down through successive generations of minstrels or gleemen, each one modernizing and adapting both incidents and language to his own time; and finally committed to writing, like many other ballads of later times, by some learned *Clericus*, (who, however, they say was no great Saxon scholar,) for the benefit of posterity.

The GLEEMAN'S or TRAVELLER'S SONG has had precisely the same fortune. We cannot conceive a minstrel even, travelling to every part of Europe, over Africa and a great part of Asia, visiting every court, and recording the valuable presents he received, and this for a period of eighty years, in the disturbed state of the fourth and fifth centuries. I take it as a part of the regular stock of a minstrel, an introduction wherever he went, complimentary to himself and instructive to his hearers. The copy which we have was no doubt the latest edition, with all the additions that had been made for generations before, as each might add his fresh knowledge to the general stock. The Engla, Sexna, Danes, and Welsh had alike their bards or minstrels, who were continued down to a late period: but no one would attempt to write a history of Robin Hood from the ballads, and give it to the world as authentic. Genuine historical documents commence about the seventh century, and appear in the form of chronicles, which seem to have been made in the monasteries; they gradually become more full and important, and contain letters and charters. They are numerous on the continent, but with the exception of our own Saxon chronicle and the Brut y Tywysogion are all written in Latin.

Having thus cleared the ground before us, we may now turn to the actual materials of history, and detail the events which preceded the expulsion of the Roman governors.

In the year 364, Ammianus Marcellinus tells us that the Picti, Saxones, and Scoti harassed the Britanni with perpetual attacks: and in 368 the emperor Valentinian, on his route from the Ambiani to the Treveri, was overwhelmed with the serious intelligence that Britain was reduced to the

last extremity by a barbarian conspiracy; that Nectaridus, the count of the maritime district, was slain, and that Fullofaudes, the duke, had been cut off by the snares of the enemy. The news of this barbarian conspiracy was listened to with great horror, and after various appointments having been made and superseded, on account of the many and fearful things which continued to be rumoured regarding the island, Theodosius was at length sent there. The historian adds that he had already, to the best of his ability, described Britain, but unfortunately the book is lost. "At this time," he says, "it will be sufficient to state that the Picti, then divided into two tribes, (the Dicaledones and the Vecturiones,) the Attacotti, a warlike nation, and the Scoti, wandering about committed many ravages." He had carefully distinguished this barbarian conspiracy from the revolts of the soldiers in favor of some candidate for the purple; and he continues, "but the Franci and Saxones ravaged the Gallican districts to which they were next neighbours by sea and land, wherever an attack might be made, spoiling and burning, murdering and making captives."

The Gallican districts can only mean the land opposite Gaul, for Theodosius sailed with his troops from Boulogne, and no intimation is given that the French coast was at all disturbed; so that these Franci and Saxones were acting in concert with the Picti and others of the barbarian conspiracy. The Roman general landed without opposition at Richborough in Kent, and marched to London, which had afterwards the name of Augusta. He divided his troops and attacked the wandering predatory bands of the enemy, loaded with spoil and driving away cattle, and captives in chains, he released the prey which the wretched tributaries had lost, and except a small portion assigned to his weary troops, he gave back the whole. He entered London in triumph, a city which had been so lately overwhelmed with difficulties, but now at once was made over again. He here learnt from prisoners and deserters that such a people, cruel and fierce, and of various families, could only be reduced by deeper schemes and sudden attacks. He proclaimed an amnesty, and summoned the deserters, as well as those who were absent on leave, to actual service; many obeyed the summons, and Civilis was appointed governor of Britain as Pro-Prefect, while Dulcitius was made the duke.

Theodosius himself collected his forces, and took every opportunity of preventing the barbarians making head again. He shared in every danger,

overthrew and put to flight the various nations who, in fostering security, insolently attacked the Roman powers; restored the cities and fortresses which had suffered from many injuries, though built for a period of lengthened peace. He also nipped in the bud a conspiracy that had originated in his own camp, and having rebuilt, as before mentioned, the cities and garrison fortresses, he protected the boundaries with guards and advanced posts. The province, which had been completely in the power of the enemy, was recovered, and restored to its former state, and by the will of the emperor was then called Valentia. Finally, we are told that Theodosius removed the Areani from their stations, a body of men formed of old time for the purpose of conveying intelligence through long distances of what was passing in neighbouring states to the Roman chiefs. They had been bribed with promises of booty, and betrayed the Roman affairs to the barbarians. The manuscripts are deficient at this point, and *Areani* is a bad reading, but the reference is clearly enough to the *Curiosi* or *Agentes in rebus*, described in my former paper.*

This revolt was put down in 369. It appears to have spread over the whole island, the portion which belonged to the Engla had for a time established its freedom, and the history is particularly valuable for the insight which it affords us into the state of parties at the time; the Britanni representing the Roman party in the island, and opposed to them the barbarian or native party, including the Picti, Saxones, Scoti, and Attacotti.

The Attacotti are named again only by St. Jerome, and in the Notitia as embodied in various imperial cohorts. St. Jerome tells us that when he was very young, *adolescentulus*, he had seen in Gaul, the Attacotti, a Britannic tribe, eating portions of human bodies, which they considered the most delicate of all kinds of food. Of the locality of these Attacotti we have no information.

The Scoti are first named in the latter half of the fourth century; they are said to have been originally settled in Ireland, and then passed over into Scotland and gave it their own name. St. Jerome says that they, as well as the Attacotti, had no marriage laws, but his statements are entitled to little credit.

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* Amm. Marcell. 26, 4; 27, 8; 28, 3.

I believe that the Picti were not a particular tribe or clan, located in some special part of the island, but that the name was applied to all who opposed the Roman power in the middle and north, or English district. In fact all these parties merge in the Engla and Sexna, and in the year 408 they ejected the Roman præfects, and established a free and independent state for themselves. It must not be supposed, however, that this was done at once. It is easier to overthrow a government than to build one up, and during this period of rebuilding there will be evident danger if a strong party is in the field. The immediate cause of the revolution in 408, was the removal of the Roman troops to the continent. But we conclude from subsequent events that the Britanni, *i.e.* the Roman provincials, including the great land-holders, the office-bearers, descendants of the Roman soldiers and settlers, officials of all kinds, and those connected with them by interest, blood, and other ties, were not inclined to give up their position at once; and the history which we have now to examine will be of the struggle between these two great parties,—the Engla and Sexna on the one hand, and the Britanni on the other, when the Roman legions were no longer at the command of the latter. The central points of the Roman party were the cities, which would have the advantages of wealth, official experience, unity and organization; and we learn from Zosimus that Honorius, in 410, wrote letters to the cities in Britain advising them to look after themselves.*

This was excellent advice, but of no great use; the cities were gradually either destroyed or deserted, and the Britanni were, as well as the rival party the Picti, in the course of three or four centuries extinct. But disastrous as the contest was to the Roman party, it seems quite certain that some cities continued in prosperity, and others were rising up and assuming an independence of their own. Indeed I believe that London retains portions of the old laws of the Roman city, and that York also participates in this antiquity. Probably Chester also may be reckoned another of these centres of civilizing influences. They were then, and for centuries afterwards, rich and powerful governments in themselves, defying alike Engle, Sexe, and Norman. Of the *five burhs* Lincoln and Leicester were also Roman cities, and Roman towns were at no great distance from the other three, Stamford, Nottingham, and Derby. The Britanni made twice applications to Rome for assistance, which was granted, and we are

* Zosimus, lib. 6, c. 5, 10.

told that with their help they overcame their enemies. But a single legion of a thousand men could be of little effectual service, and the Roman towns were deserted, and if not destroyed at once, left to the slow but sure effects of time and the elements.

It is singular that we have no account of the siege or capture of any city, but when the whole of the rural districts are in the hands of an enemy, the cities must of necessity be deprived of supplies, and we may suppose that the more they depended upon the surrounding district only, the sooner their destruction would be effected. Those provincials who could, emigrated to the continent, others made peace with their copatriots, as we learned from the triads,* and others being in a state of serfdom were merely transferred to new masters; some might be reduced to bondage by the stronger party. It must be borne in mind, however, that this fact, which comes out of the subsequent enfranchisement of the serfs 400 years after, refers entirely to the Teutonic people. They belonged to, and were transferred with, the estates.

But the barbarians had triumphed, and in the *tun*, or *ham*, or *thorpe* assumed that individual freedom and independence which is so peculiarly characteristic of the race. Whether Christianity had made any great progress amongst them may be doubted, and it is certain that as a nation they returned to their old religion, laws, and kings. Of their religious ceremonies, buildings, or belief, we know little or nothing, but I should not hesitate to assign the mysterious erection of Stonehenge to the fifth century. While clearly not Roman it has marks of Roman influence about it, and what so likely as a great national temple to inaugurate afresh their newly recovered liberty. As yet they were rich in the spoils of the defeated Britanni, and the influence of Roman skill, science and taste would be lingering amongst them. The account in Beda of the destruction of the heathen temple near York is exceedingly curious, and it seems to have been an open inclosure like Stonehenge.

As to their kings, we have no information respecting their position, their power, or revenue. The Saxon chronicler is especially careful to carry back the pedigree of each to a divine origin; they were leaders of armies, and perhaps presidents of the national assemblies; but the people seem

* Medrod and Aeddan became *as Saxons*. See above.

to have treated them with little ceremony, and laws of succession appear to have been unknown. They may have come from the islands at the mouth of the Elbe, which Meginhard says were peopled by the inhabitants of Britain who had fled from the Romans—invited as their natural leaders, and quite in accordance with the proceedings of the times; they arrived with their immediate followers in two or three vessels, and this would give the finishing blow to the Roman party, as all that the barbarians wanted was unity and leaders.

We have now to examine the only contemporary work left us, "GILDAS ON THE DESTRUCTION OF BRITAIN," and I am sorry to say that it very imperfectly fulfils the expectations suggested in the title. Of the author we know nothing, except what he tells us himself, but we may gather from his account that he was an ecclesiastic, that he was of the *Britanni* or Roman party, and that he must have lived at any rate into the latter half of the sixth century. He acknowledges that his history is composed "not from the writings of his country, or the memorials of authors, for these (if any such had ever existed) were either consumed by the fire of the enemy, or carried abroad by the exiled citizens, but from foreign relations which are necessarily imperfect and interrupted." This statement proves that Gildas had seen no such records, and was not aware that any such were in existence, and it is confirmed by the internal evidence of his own work, which exhibits a degree of ignorance not easily matched. Learning must have been at a very low ebb, and the British clergy and monks seem to have made no pretension to it. But it was undoubtedly in the cloister that our early chronicles originated and were kept, and upon this point we are quite justified in taking his assertion literally.

This history in the "MONUMENTA HISTORICA BRITANNICA," is divided into twenty-six sections, the last fifteen of which have the following titles :—

11. Of the two victorious nations—the first devastation. 12. The defence. 13. The second devastation. 14. The second vengeance. 15. The third devastation. 16. The famine. 17. The epistles. 18. The victory. 19. The sins. 20. The sudden reports of the enemies. 21. The famous pestilence. 22. The council. 23. The enemies more cruel than the former. 24. The overthrow of the cities. 25. The relics. 26. The final peace which the last victory by God's permission achieved."

To fill up this sketch as shortly as possible, the two conquering nations

were the Picti and Scoti, who from beyond the sea, commenced their ravages as soon as the troops had withdrawn from the island. The citizens applied to the Romans for succour, and this aid soon sent the invaders back to their own country. On the return of the legion however, the enemies made their second appearance; there was a second application for aid, and another rout and dispersion of the barbarians. A second wall was built, for the former legion had made one across the island of turf. This was made of stone—and then the Romans left the island to return no more.

Now, in all this, the narrative is at utter variance with established facts. The Scoti and Picti did not come from beyond the sea, did not carry away their prey by sea every year, as he also asserts; and the wall, which under these circumstances could have been of no use, was built 200 years before. But to return to Gildas.

The Romans exhorted the citizens to arm and defend themselves, and besides the wall in the north, they built towers on the south coast where the enemy's ships came, and where the fierce barbarian boats were dreaded. But the third devastation followed the departure of the troops; the invasion being again by ships; the same destruction and ravages were repeated, and to these calamities were added famine and civil war.

It was then that they wrote their pitiful supplication,—"The groans of the Britanni to Agitius. The barbarians drive us into the sea, the sea drives us back upon the barbarians." But their application was in vain; and then, trusting in God and not in man, they gave to slaughter the spoilers who had been so many years in the country. The enemy retired from the citizens, but the citizens did not forsake their sins. Then came a sudden rumour that they were about to return, to destroy, and to take possession of the whole country, but this rumour was disregarded: a terrible pestilence followed, and a council was held to determine the best means of repelling the frequent and cruel attacks of the foe. Then the councillors, with the proud tyrant *Gurthrigernus dux Britannorum*,* were all so blinded as to invite the Saxons to their assistance. "And this flock of cubs from the den of the barbarian lioness, burst forth in three vessels, in their language called *cyulis*, in ours *long ships*. They sailed with prosperous omens and auguries, and a sure prophecy that they should possess the land for

* This *dux* seems to have been the successor of the Roman *dux* or duke.

300 years, and that for 150 they should frequently ravage it." The same country, finding that the previous body had succeeded, sent out a fresh company: they asked for provisions, and not being satisfied with what they got, threatened, and deeds followed the threats. They had landed on the east side of the island, and began by attacking the cities and country next them, but ended not till the whole land to the western ocean was consumed. The pillars were overthrown with battering-rams, all the colonists, with the bishops of the church, priests, and people were given to the sword.

Then as before, some fled to the mountains and woods, some beyond the sea, some submitted to the conqueror, till at length the fierce robbers returned home, and the miserable remnants assembled once more from their places of refuge under Aurelius Ambrosius: they make head, attack their conquerors, and by God's help gain the victory. Aurelius Ambrosius is described as of Roman descent, his parents (by which we may understand his family,) having been clothed with the purple, but all had been slain in the previous devastations.

"From that time, sometimes the citizens, sometimes the enemy had the advantage,"—"Till the year of the siege of Mons Badonicus, which is near the mouth of the Severn, when the last and not the least slaughter of the hangdogs was made. One month of the forty-fourth year since then has just passed, as I know from its being also the year of my birth. External wars are now over, but civil wars continue, and the cities still remain deserted and destroyed." The generation which witnessed these changes, kings, public officers and private persons, priests and ecclesiastics, conducted themselves with due regard to their order. But after their departure all these mercies were forgotten, hardly a trace of the previous religious and right feeling was left, and few indeed did the reverend mother the church behold in her bosom, in comparison with the mighty multitudes which were daily rushing down to Tartarus.

Throughout the history, the distinction is kept up between the *cives* and *hostes*, the citizen and the enemy. He sometimes uses the term *Britones*, but in the letter to Agitius we have the *Britanni* and *Barbari* as in Marcellinus. The accounts in the Saxon chronicle of this period are of little value. According to it the king Wyrtgeornes invited Hengist and Horsa into the island in 449. Two battles were fought with the Brettas in 455 and 457; after the last the Brettas forsook Kent, and fled in terror

to London. Ella landed in Sussex in 477. It was not till 519 that Cerdic and his son Cynric obtained the kingdom of the West Sexna, and not till 547 that Ida ruled the Northumbrians. Except the kings of Wessex, who pushed their conquests to the Severn in 577, the others seem to have had little trouble in establishing themselves. In no instance is the capture of a large town recorded till 577, when Gloucester, Bath, and Cirencester fell into the hands of Cuthwin and Ceaulin. Not a single contest is mentioned as having occurred in England proper, including the Angles, Mercia, and Northumberland.

It is curious, too, that we find in the chronicle the same restriction of names as in the Latin writers. The Britanni are sometimes called Brettas, sometimes Walas, and sometimes Bretwalas. The Teutons to this day call the Italians Welsch, and this is the appellation applied to the Romans in the dark period of the empire. The other names are more uncertain. We have Angle, Engle, Angela, also Saxe, Sexna, and Saxna, and I am inclined to think that there were originally, distinct names for the continental and insular tribes, which were confounded when reduced into Latin forms.

But there is another work of Gildas besides his history,* which is in one respect most important, as it gives an account of the then state of Britain, and of five kings who are all addressed as being in the height of power and wickedness. "Britain," says he, "has kings, but they are tyrants; she has judges, but they are unrighteous ones, they prey on the innocent, and favour the robber. The crowd of prisoners in the gaols are there by treachery, not for crimes;" perjury and various great sins are represented as universal.

Constantine, whom he calls the tyrannical whelp of the unclean lioness of Damnonia, is accused of having murdered at the holy altar, and in their mother's arms, two royal youths, with their two servants, the very year in which he was writing. Aurelius Conanus is bid to remember the vain and idle fancies of his parents and brethren, together with the untimely death that befel them in the prime of their youth. He is said to be swallowed up in the filthiness of horrible murders and other crimes, and worse even than Constantine. Vortiporius, the foolish tyrant of the Demetians, the South Welsh, whose head is now growing grey, the wicked son of a virtuous king, is seated on a throne full of deceits, and

* Gildæ Epistola, Mon. Historica Brit. p. 16.

from the bottom to the top stained with murders and other sins. Cuneglasus, the tawny butcher, (as in the Latin tongue the name signifies,) amongst other titles is called a bear, and the guider of the chariot which is the receptacle of the bear. He had raised a great war against his own countrymen; he had driven his wife away, and taken her sister, who it seems had before taken the vow of chastity. But the worst of the lot is Maglocunus, who is thus addressed:—"O thou dragon of the island, who hast deprived many tyrants as well of their kingdoms as of their lives, and though last mentioned in my writing the first in mischief, exceeding many in power, and also in malice; more liberal than others in giving, more licentious in sinning; strong in arms, but stronger in thy own soul's destruction, &c." He had at the beginning of his youth oppressed his uncle and his brave soldiers with sword, spear and fire; and at a later period he appears to have felt or feigned a wish to become a monk, but this was not to be. "Oh, how great a joy would the preservation of thy salvation have been to God, the father of all saints, had not the devil, the father of all castaways, as an eagle of monstrous wings and claws, carried thee captive away against all right and reason, to the unhappy band of his children!"* He had murdered his own wife and his nephew, and married the wife of the latter, at whose suggestions these crimes had been committed; and yet this king had had the most eloquent teacher of all Britain. Lastly, he says, there are priests, but they are unwise; very many that minister, but many of them impudent; clerks, she hath, but certain of them are deceitful ravenous; pastors as they are called, but rather wolves prepared for the slaughter of souls; * * instructing the laity, but showing withal most depraved examples, vices and evil manners; * * violently intruding themselves into the preferments of the church; * * wallowing in the puddle of wickedness after they have attained the seal of the priesthood or episcopal dignity, &c., &c.†

As a historian, Gildas shews himself miserably deficient, and his HISTORY is of little value. But in the EPISTLE we find him in another character, and bitter as his language is, and fierce as are his denunciations, he here speaks the truth fearlessly, and gives us a vivid picture of a most awful period. He warns as an old prophet might have done, king and priest, noble and citizen, of the terrible judgment that was coming upon them. The wicked-

* Giles' Translation of Gildas—Bohn's Ant. Lib. p. 320. † Ibid, p. 344.

ness that overwhelmed the Roman empire pervaded Britain, as well as every other portion of it, but the wickedness was essentially Roman; neither Engla, Sexna nor Celts, except with those limitations already pointed out, those who had made themselves parcel of the Roman government, had anything to do with it but to sweep it away from the face of the earth which it had polluted so long. Two of the kings are named as being of the Devonians and South Welsh, the others might belong to North Wales, Cumberland, and Strathclyde; but the people of the two last were of Teutonic blood. Whoever will read the 7th book of Salvianus of Marseilles, DE GUBERNATIONE DEI, will have no doubt that these cives Britones or Britanni, were the Roman provincials, the Romani of Salvianus.

We have seen in 369, that a Roman legion was sufficient, with the help of the Britanni, to put down the native party. At a later period, three ceols, which would hardly contain fifty men each, were enough to destroy utterly the Roman provincials. The Picti had already assumed their national appellations of English and Sexe, and the Britanni were soon lost in the primitive Cymry. The Roman empire was in a state of rapid and inevitable dissolution, and England had this advantage over the states of the continent, that her own children achieved her independence and nationality, and even then the foundations of her future greatness were laid.

ON THE SNOWS AND SNOW CRYSTALS OF THE WINTER 1854-55, AS OBSERVED AT WARRINGTON.

By Thomas Glazebrook Rylands, Esq.

(READ APRIL 26TH, 1855.)

My wish in preparing the following communication has been two-fold: to lay before you certain observations I have made during the past winter; and to attract more general attention hereafter to the richness and variety of what, with little license, may be called the "treasures of the snow."

I know no class of objects so easily accessible by every one, which at the same time offers equal attraction, and is capable of affording so large an amount of gratification to all classes of observers. At the hands of the British meteorologist, at least, this subject demands, as it deserves, a much more careful investigation than it has hitherto had. So few have been the snow observations made in this country, that it is impossible to say whether

the large variety of crystals seen during the past winter are of rare or of common occurrence. Thus much, however, we may affirm, that the Polar snows have, up to this time, produced no crystals more complex or beautiful than the snows of our own climate, the difference being simply, that they are occasionally larger than our own. Captain Scoresby gives one-third of an inch as the diameter of the largest he figured during his several voyages to Spitzbergen and Greenland, which is rather smaller than one now recorded; but Sir Edward Belcher, in a letter to Mr. Glaisher, states that many crystals with *radii* an inch and more in length were seen by him in the Arctic seas.*

Captain Scoresby's work has been carefully examined, with the view of making a comparison between his observations and my own. This attempt has resulted in the conviction, that to render such observations practically valuable, a more definite statement of the atmospheric condition at the time, than he has furnished, must be recorded. Without this, the forms themselves alone can be compared, all conclusions of higher value being difficult, if not impossible.

In selecting from the multitude of forms seen, those of which drawings have been made, my aim has been to preserve such as I considered the typical modifications of the snow from which they were obtained, and so many as seemed necessary to shew the variation to which some of these types are subject. With one or two exceptions, the crystals were collected on a slab of plate glass, and were sketched while in that position. To shew that the process of sketching is not necessarily a hasty one, I may mention that at temperatures but two or three degrees below the freezing point, crystals have remained unchanged for from twenty to thirty minutes while under observation.

The lens used throughout was one of Mr. Ross's Coddingtons, the magnifying power of which is about twenty linear at six inches; it defines clearly, lines which cannot be more than the four or five thousandth of an inch in breadth. I found no practical advantage in using higher powers, but regard the constant employment of the same power as more important.

My only regret in producing these drawings is that they convey so feeble an idea of the exquisite beauty, and perfection of detail, seen in the

* Captain Scoresby's observations were confined to the months of April, May, and June. The season and locality of Sir E. Belcher's are not stated.

originals: they have, however, been made with all the care I could command, and considering the difficulty of representing, by little more than diagrams, objects of so complex and delicate a character, are such, I believe, as may be relied on. None but perfect crystals were drawn; generally they were about the twentieth of an inch in diameter; when much larger or smaller the measurement of them is stated in the plates.

On taking a general view of the figures, it will be seen that the forms which enter into their composition are, the granular, acicular, and tabular; and that the last may be again divided into the circular, stellate, prismatic, and hexagonal. Further, it will be observed that the acicular forms in particular are sometimes *winged* or *foliated*, exhibiting leaf-like expansions, with toothed or irregular edges: and lastly, that in some the *rays* or primary branches spring from a central *nucleus*, while in others the centre is simple. Now by the use of these terms, together with about the same number, borrowed from botanical phraseology, I have found little difficulty in describing, in a few words, even complex crystals, so as to reproduce, in my own mind at least, an accurate idea of their peculiarities. My rule has been to separate the description of the nucleus from that of the ray, and to write the several forms as they occurred in succession from the centre of the former to the extremity of the latter. By this means a record has been secured of several specimens, under circumstances in which it was inconvenient or unnecessary to make drawings.

I am not aware that observations were omitted on any day when snow fell. Perfect crystals were seen on thirteen days, and it is somewhat curious that on every occasion except two, the best crystals fell at or about nine o'clock in the morning.

In the annexed table I have collected such meteorological results as seemed most important, and, added to this table, the abstract which follows of the notes made in my journal, conveys all the information within the limits of my means.*

* The Warrington register unfortunately includes only the readings of the barometer, hygrometer, self-registering thermometers, and rain-gauges, together with the usual wind, cloud, and weather observations. But we are informed by Mr. Glaisher that "Doctor Smallwood, of Isle Jesus, Canada East, has traced an apparent connexion between the form of the compound varieties of snow crystals and the electrical condition of the atmosphere, whether negative or positive," and that he is engaged upon further experiments. Such a connexion is far from improbable; and it is to be hoped that ere long this important class of observations will be more generally made in England. At present they are almost wholly confined to the Royal Observatory.

METEOROLOGICAL RESULTS FROM OBSERVATIONS MADE AT THE TIMES CRYSTALS WERE OBSERVED.

Date and Time of Observations.	Barometer corrected & reduced to sea level.	Thermometer in shade.	Dew point below air temp.	Grs. of vap. in a cubic foot of air.	Humidity. (saturation = 1·0.)	Minimum on grass.	Terrestrial radiation.	Direction and Force of the wind.	Reference to the figures of the crystals observed.
1855.	In.	°	°	Grs.		°	°		
Jan. 30. 9 A. M.	29·864 s.	28·8	8·0	1·59	·74	7·2	9·0	E. Light air.	Figs. 1, 2, 3.
Feb. 6. Noon.	„ r.	39·0	„	„	„	33·1	1·0	N.E. „	„ 4.
„ 8. 9 A. M.	30·064 r.	27·2	9·2	1·15	·57	22·2	4·2	N.E. Light breeze.	„ 5, 6, 7, 8, 9.
„ 11. 9 „	29·733 f.	23·4	4·2	1·21	·68	9·3	6·0	N.E. Calm.	„ 10, 11, 12.
„ 13. 9 „	29·588 f.	20·8	·0	1·62	1·00	11·4	8·1	N.E. „	„ 13 to 19.
„ 14. 9 „	29·488 f.	23·8	14·2	1·06	·59	11·0	8·9	N. „	Simple hexag'l prisms
„ 18. 9 „	30·100 s.	18·0	·0	1·47	1·00	1·6	9·3	E. Light air.	Figs. 20, 21.
„ 21. 9 „	29·936 s.	22·8	1·7	1·63	·94	5·7	8·9	Calm.	„ 24.
„ 22. 5 P. M.	„ s.	„	„	„	„	„	„	S.E. In gusts.	„ 22, 23.
Mar. 10. 9 A. M.	29·896 f.	28·8	·0	2·13	1·00	27·7	0·3	S.E. Light.	„ 25 to 34.
„ 11. 9 „	„ f.	„	„	„	„	„	„	S.E. „	„ 35, 36, 37.
„ 12. 9 „	28·899 f.	35·6	1·0	2·67	·97	30·7	0·2	S.W. Fresh breeze.	„ 38, 39.
„ 23. 3 P. M.	29·276 r.	35·5	4·5	2·27	·85	31·5	0·8	N.E. Mod. breeze.	„ 40.
„ 28. 8.30 A.M	30·148 r.	35·3	3·0	2·39	·90	21·2	7·2	N. Light air.	„ 41.
Apr. 3. 9 A. M.	29·800 f.	34·8	2·9	2·35	·90	32·1	1·5	E. „	„ 42, 43.

The letters attached to the readings of the Barometer indicate whether the mercury was rising, steady, or falling at the time.

The thermometers in the shade are placed four feet above the ground.

The hygrometrical deductions are obtained from Mr. Glaisher's tables.

The force of the wind is expressed in the terms of the scale given p. 43 of the Royal Society's Report on Physics, including Meteorology; April, 1840.

The minimum on the grass is that which occurred during the preceding night, and the *terrestrial radiation* is the difference between these readings and those of a similar thermometer in the shade.

From the first to the fifteenth of January the sky was generally covered with cloud; the mean temperature was 42·2°. No snow had been recorded up to this time. During the night of the sixteenth a change took place; and the mean reading of the thermometer from that day to the end of the month was 30·4°.

Pulverulent hail was recorded on the 17th and 22nd. Imperfectly crystallized snow, with sleet, on the 21st and 26th, at temperatures varying little from the freezing point; on the last named occasion snow fell during the night to the depth of nearly two inches, the density of which was about one-tenth that of water. The first perfect crystals, respecting which I have the following note, were seen as follows:—

January 30th, 9 a.m. "Sky obscured by dense and rather low cumulo-stratus cloud; hoarfrost on the grass; light snow falling, chiefly composed of fig. 1. Figs. 2, 3, and others of the same forms, variously combined, not uncommon. The snow was not sufficient to cover the ground."

The mean temperature of the month of February, at Warrington, was 28·8°; at Greenwich it was 29·3°, which is the lowest yet recorded there for this month, in a register extending back to the year 1814.

The frost which commenced on the 16th of January continued until the 3rd of February, and the weather was then broken for two or three days.

February 6th, 9 a.m. "The ground white with frozen rain, which on examination is found to consist of transparent spherules of ice, resembling minute hailstones. This whiteness is confined to those situations where the raindrops have been dispersed on falling, as on the grass, and under the branches of certain trees: the hard walks and flags are covered with sheets of ice.

At noon the sky became gradually obscured by dense cloud, from which fell first powdery hail, and then the stars fig 4, many of them perfect, and quarter of an inch across. Under the lens there were found to be snow crystals covered with the same peculiar spherules of granular hail, which I saw this morning. The amount of covering varied considerably; some of the stars being rendered almost spherical, while many shewed sufficient evidence of the crystal within. The snow fell thickly, but only for a minute or two.

February 8th, 9 a.m. Snow during the night to the depth of quarter of an inch, and still falling lightly. The sky is about half covered with clouds of variable character. Crystals numerous and beautiful, chiefly acicular and hexagonal. Figs. 5, 6, 7, 8, 9, were sketched between nine and eleven o'clock, together with other allied forms, which have been previously observed and published by Dr. Nettis and Captain Scoresby; and several, which since have been recorded under this date, by Mr. Glaisher of the Royal Observatory.*

* The crystals figured by Dr. Nettis, (observed at Middleburg during the severe winter of 1740,) are published in the Philosophical Transactions for 1775; those by

SNOW CRYSTALS.

PLATE I

E.G. Rylands, Del.

W.J. Hammond, Lith.

SNOW CRYSTALS.

PLATE B

T. W. Wilmarth, Jr.

T. J. Hammond, Lith.

Fig. 5 was the only crystal seen which had twelve rays.

It was on the 9th of February that the most severe frost of the late rigorous winter set in; and from that day until the 24th, when the thaw commenced, the thermometer in the shade was rarely more than two, and but once four degrees above the freezing point. The wind varied from north to east, but was nearly calm throughout. There was not altogether, until the 22nd, snow sufficient to be registered by the gauge. The meteorological observations give the following results for these fifteen days:

Mean temperature	24·6°.
Mean dryness	4·4°.
Mean minimum on grass	9·4°.
Mean terrestrial radiation	8·5°.

There was a copious hoarfrost on the ground every morning until the 23rd.

Such a condition of the atmosphere as this, might well be expected to produce snow crystals exhibiting high forms of crystalline development. It will be seen that during this period the most perfect crystals have occured.

February 11th, 9 to 10 a.m. The slight snow which has just fallen from a passing cumulo-stratus, consists altogether of separate crystals not combined into flakes, of which fig. 11 is by far the most common. These stars, often measuring more than the third of an inch in diameter, were formed wholly of gradually diminishing hexagonal prisms, with beaded angles. They were more or less deeply indented, but many of them, like the figure, such as would result from the intersection of two perfectly equilateral triangles.

The eleventh of February, it will be remembered, was a Sunday, and these large and beautiful stars, falling about the time of church going, were seen by many persons over a considerable district—near Liverpool as elsewhere. They were, perhaps, the first snow crystals generally noticed in England for many years.

While sketching fig. 11, I first observed the fact that crystals, when slightly thawed, were not always melted into shapeless masses, but assumed new and definite forms; thus the prisms composing fig. 11 took the shape of the rays beyond the hexagons in fig. 13. Impressed with the idea that

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Captain Scoresby in his "Account of the Arctic Regions," Edinburgh, 2 vols. 8vo., 1820. A large proportion of both series will be found in the Encyclopœdia Metropolitana; article Meteorology. Mr. Glaisher's figures have hitherto appeared only in the Illustrated London News for February 17th and 24th of the present year.

a similar procedure with other specimens might throw some light on the formation and markings of snow crystals generally, I attempted to produce changes in many after I had observed them. The results were often instructive; but the effect produced upon fig. 10, which I had just sketched on account of the curious one-sided development of the prisms near the centre, was very remarkable: these prisms were melted and ran towards the centre of the crystal, but in so doing left a well defined stellate cavity; and when the fluid was refrozen I had under the lens fig. 10a, which was the first nucleate form I ever saw. It is not safe to generalize from a single fact under such circumstances, but I have since seen many apparently identical nuclei, produced without the intervention of human agency.

Fig. 12 shews a peculiarity not very uncommon in certain forms, but only in this and one other instance have I seen the secondary set of rays complete in number, and moderately uniform. They are not always inclined.

February 13th. Before I was able to leave the house this morning, a few specks of snow fell from a sky in which there were but one or two lofty cirri and a light haze. The crystals were examined very shortly afterwards on the iron lid of one of the thermometer boxes.

I shall not readily forget the intense feelings of delight I experienced when the forms collected on that lid first met my view. Figs. 13 to 19 represent a few of the most simple specimens, but they convey no idea of the exquisite delicacy and brilliancy of the objects themselves; and these were almost infinitely exceeded, in beauty as in complexity, by multitudes of others. One peculiar character, however, pervaded the whole; whatever the basal modification might be, the superimposed hexagon was found in them all. It will be noticed, that in this instance the crystals were viewed as opaque objects; and this rendered the peculiarity mentioned much more evident. I have, since, never omitted, when practicable, to view all crystals by both transmitted and reflected light, and would strongly recommend the same course to others as one which affords, in some cases at least, information it would be otherwise difficult to attain.

Fig. 18 contains about 120 hexagons; the size of the crystal was less than the twentieth of an inch, and I have already called this a simple form! In others they were much more numerous, but no increase of number interfered with the symmetry of their arrangement. Of course only one

side of these objects was seen, but there was no reason to doubt that the other was like it.

Associated with these crystals were many well-defined, short, simple, hexagonal prisms, and two truncated pyramids.

Fig. 13 may, perhaps, be considered a connecting link between the nucleate and anucleate forms.

February 14th, 9 a.m. Under this date the note in my register is simply—Again a little snow this morning, in small single hexagonal prisms Hazy. Sky nearly cloudless. Air unusually dry.

February 18th. A very few separate crystals this morning at nine o'clock, hardly less beautiful, though very different from those seen on the 13th. These snows are certainly formed in the lower regions of the atmosphere, and have no connexion with clouds seen at the time. This morning there were but two light clouds near the horizon. Figs. 20, 21 were the only drawings made. These were selected on account of the foliation which had a character very distinct from that seen in figs. 1, 10, 12, 40, or 42. It was much more angular and even.

During the night of the 17th the temperature attained its minimum, and from this time the sky was more clouded.

February 22nd. This afternoon, while enjoying the recreation of skating on the river, about two miles to the *east* of Warrington, the wind commenced blowing in gusts from the south east, and the sky became gradually mottled with light flying clouds. At about five o'clock snow began to fall in separate, thin, spangle-like stars, measuring from the eighth to the twelfth of an inch; sufficiently large and well defined to be seen and admired by all the party.

Near the commencement of this snow storm, fig. 22 and several closely allied forms were examined, and about the same time my friend Mr. William Fell, an amateur artist of no ordinary ability, made the drawing from which fig. 23 was copied. This crystal was seen to the *west* of the town, and has been introduced as an additional proof of the relationship which often exists between crystals collected on one occasion at places distant from each other.

The great evidence of change in the characters of these crystals, as compared with those of the previous fortnight, can hardly be overlooked. At the time I was so struck by it as to venture a prediction that the weather was about to break. This anticipation was speedily realized. The clouds became more dense, the snow commenced falling thickly in flakes, and by a little after six o'clock, consisted only of fragmentary acicular and granular snow, which by the next morning lay two inches deep, yielding one-eleventh that depth of water. The next day the thaw set in.

From the 24th of February to the 5th of March, rain fell on most days. From the 6th to the 9th there was a slight renewal of the frost, and during the morning of the 10th a snow storm commenced, which lasted at intervals until near noon on the 12th, the sky being obscured by dense cloud nearly all the time.

The progress of this storm appears to me peculiarly instructive in connexion with the study of snow crystals. During the two days that it lasted the barometer fell fully an inch, and the temperature rose from 29° to 42°. The wind at first blew lightly from the south-east and south, and we had afterwards a gale from the south-west and west.

The experience of February 22nd had made me anxious to watch the changes which might take place in the crystals of a prolonged snow fall, a better one for the purpose could hardly have occurred, one in which the changes were at once so distinct and numerous. Some of these will be gathered from the following notes.

March 10th, 9 a.m. Flakes of crystallized snow falling. Nearly all the crystals have a stellate centre in the nucleus.

Figs. 25 to 33 were sketched at this time; but in addition to these "lamellar" crystals, in which the rays are all in the same plane, there fell numerous tufted crystals, of the "echinose" genus, with an indefinite number of rays springing in all directions from a concealed nucleus. The rays in these were not uniform, and their number rendered it impossible to make drawings. The distinction between the flakes consisting of tufted and those of lamellar crystals was strikingly evident when they were collected on the glass. The former remained as flakes, while the latter were distributed by the concussion into the most beautiful clusters of from 20 to 50 stars, very uniform in character. To many crystals were attached rather large, thin, overlapping, hexagonal plates, as seen in fig. 34. By noon the lamellar crystals had disappeared.

I have already mentioned that nearly all the crystals had a stellate centre. In one of the echinose specimens, this form was as perfectly repeated in each of the three prisms which terminated a ray, as seen in fig. 34. This was the only occasion in which stars were seen *not* in the centre of a crystal. The play of light on the edges of these stars reminded me of the changed centre of fig. 10, and a more careful examination shewed that, in the present instance also, the stellate centre, and I may add the

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other markings, were due mainly to the formation of internal cavities. I cannot describe this better than by referring to fig. 31, where an external coating of ice includes a distinctly foliated form with a cavity around. The thickness of this crystal did not exceed one-four hundredth of an inch.

Is it not probable that these peculiarities result from the snow, in its descent, passing through strata of air variously affected by temperature and moisture? At all events I cannot look upon them as indicating a high degree of crystallization considering the circumstances under which they occurred. I may add, too, that during Captain Scoresby's observations, the thermometer ranged from 10° to 32°; that the most simple, as well as complex forms, were seen at the lowest temperatures; but they are all alike destitute of this class of markings, while the crystals which exhibit the largest amount of them, and which have, some of them, a peculiar affinity to our figs. 28, 29, 30, occurred on May 6th, 1817, the thermometer reading 27°, and apparently, as in the present case, at the breaking up of a period of intense cold; for I find, from his work, that the medium observed temperature of the eleven preceding days was 15·4°, while that of the week following was 30°.

March 11. Two inches of snow during the night, and frequent, often mixed with rain, this morning: only one crystal seen, fig. 35.

At 5 p.m. Snow in large flakes, composed of confused masses of slender spiculæ, fig. 37, each consisting of two or three individuals, longitudinally combined, from one-twentieth to one-fourth of an inch long. At the same time, for a few moments, a number of lenticular rounded hexagons, fig. 36, fell sharply like frozen rain.

March 12, 9 a.m. Snow in flakes from very dense cloud; it consists almost entirely of confused, melted and refrozen forms, amongst which fig. 38 was seen, and two similar ones attached to the ends of a short prism, like wheels on an axle, fig. 39.

10. 20 a.m. A copious fall of snow, in unusually large flakes, many of them measuring 2½ inches by 1½; they are composed entirely of fig. 1.

A quarter of an hour afterwards the wind veered to the west and blew in strong gusts, the snow ceased, and rain fell heavily. The gauge on the following morning contained 0·6 inch.

There has been little snow since. A few flakes, consisting of imperfect angular concretions, fell on the 17th, and a little powdery hail on the 23rd, amongst which were seen several small stars resembling fig. 4. On this occasion the form of the included crystal was detected. It is that shewn in fig. 40. This may be called a modification of figs. 1, 5, 12, &c., being seen in all intermediate shapes, with and without the lateral expansions.

On the 28th, at 8.30 a.m., a few flakes appeared at intervals for about twenty minutes, composed entirely of fig. 40, and 41 without the nucleus which, in this instance, certainly resulted either from partial thawing, or the adhesion of a small rain drop. For a few moments the crystals were heavily granuled; engaged air bubbles were seen in them all.

On the 3rd of April, at 9 a.m., there were a few, rarely perfect, white, opaque crystals, generally simply pinnate, with broad close rounded pinnæ, fig. 42. A single example, also opaque, with more distant ramifications, and a ring centre, fig. 43, was seen at the same time.

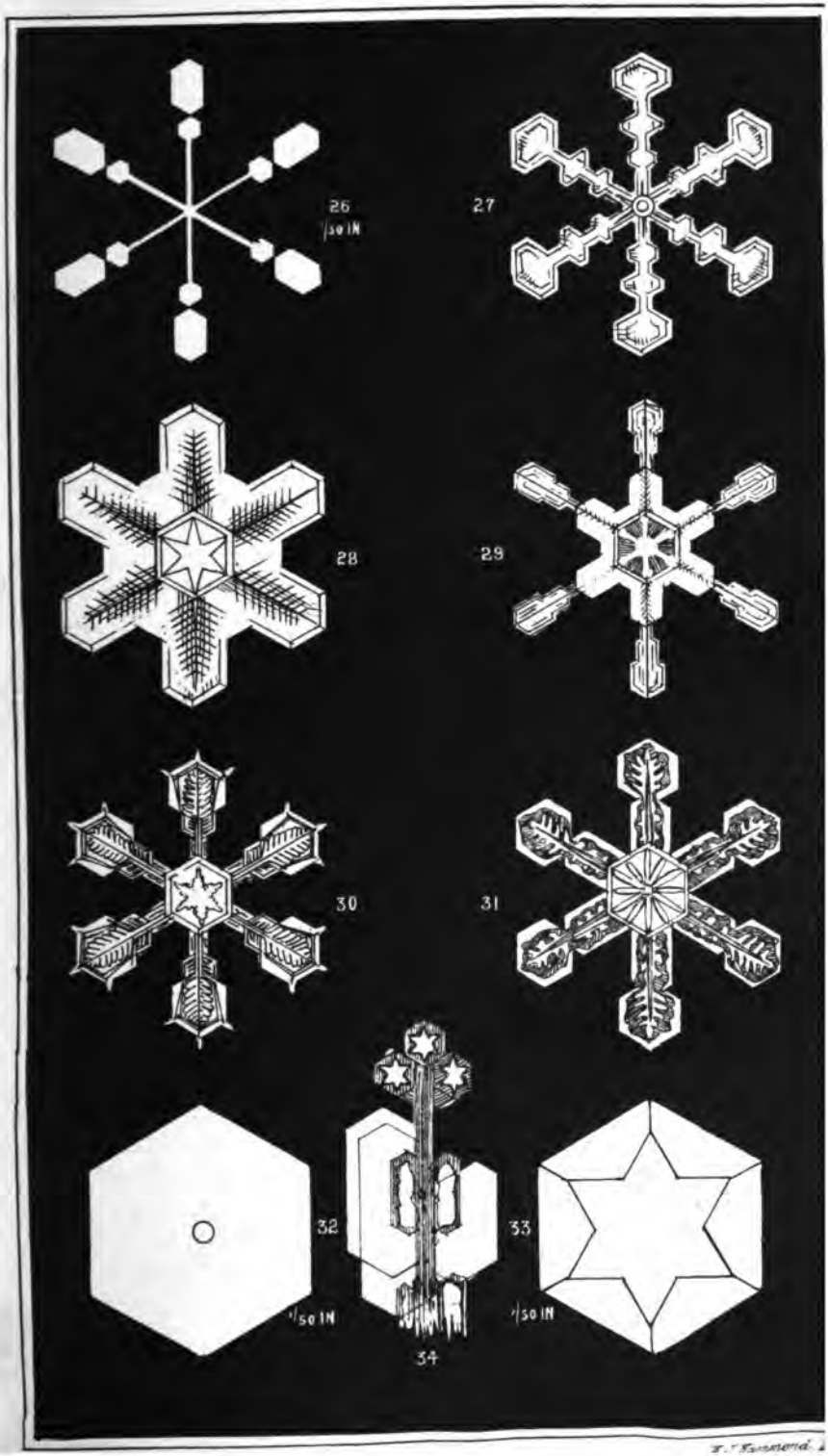
On the 10th of April, at 4 p.m., hail fell thickly, for a few minutes, in hard, opaque, amorphous masses, often a quarter of an inch across. This was the last frozen precipitation of the season up to the present time.

Such is the substance of the notes made on each occasion. Did time permit, it would be interesting further to enquire, by considering the whole interval as a single period, how far there is any connexion apparent between the characters of the crystals and of the season generally; and also to what conclusions these observations tend. A few words on these subjects must suffice.

That the past winter has been an unusually severe one I need not say. The cold was both intense and of long duration. The frost penetrated more than two feet below the surface of the ground; and situations, usually considered sufficiently secure from its effects, on this occasion afforded slight protection against its searching power. Sheets of water rarely frozen were capable of sustaining almost any weight. Remnants of the ice were seen on the 25th of March.

With the exception of one short interval, the temperature declined more or less regularly from the 5th of January to the 18th of February, and then rose until the 2nd of March; from the 5th to the 11th of this latter month the weather was again cold, and indeed, with the exception of five days, the thermometer was below the average until the 9th of April.

More than ordinary interest attaches to all observations made during such a winter; and it is probable that few in this country will be as prolific of snow crystals. Even in this respect, however, our climate may have its advantages, and may lead us neither less speedily nor securely to some of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the truths we seek. Of the almost endless variety of perfect forms seen, the illustrations contain figures of above 40. These are arranged very nearly in order as the crystals occurred, and thus afford a ready means of comparison. I may add that fig. 9, and others seen at the same time, had structurally much in common with fig. 27 and its neighbours; and that the modifications of fig. 1, 5, 12, &c., which were seen only at the beginning and end of the winter, appeared almost alone in the first and last proper snow.

So far as any conclusions are warranted from a series of observations so limited, a few of those confirmed or suggested may be briefly stated in the following summary:—

Though we have no nucleate forms before the 13th of February, these do not appear to be confined to any particular temperature, at least in the lower regions of the atmosphere; and the same may be said of such plane forms as are bounded by right lines.

A distinction appears necessary between the two classes of markings mentioned: those arising from the external addition of superimposed forms, and those from internal lines or simple variation of thickness; the one indicating a high, and the other a much lower degree of activity in the crystallizing forces.

In this, as in other similar cases, undisturbed and gradual accumulation results in the most perfect development, but the amount of moisture precipitated has also an important influence in determining the character of the crystals produced. There would seem to be in all cases a point at which the amount of precipitation is sufficient to overcome the crystallizing power. One of the most remarkable differences between the snows of N. lat. 78° and those now under examination consists, if I may so speak, in the position of this limit of crystallization. In the former, a copious and continuous fall, producing several inches of snow in a few hours, retained the character of its crystals unimpaired throughout, while in the latter, under similar circumstances, a few minutes, or at most an hour, was sufficient to change perfect crystals into the most simple rudimentary snow. This was especially noticed on the 22nd of February, and several times on the 10th, 11th, and 12th of March. In summer, also, when we may assume a much greater difference of temperature in the volumes of air

which, by their union, produce a frozen precipitation, and therefore one in larger quantity, we have almost uniformly icy hail in rounded or fragmentary masses; while in winter such hail is of rare occurrence in these latitudes, and is never seen in the arctic regions. On the contrary, cloudless skies on the calm mornings of the 13th and 18th of February produced the most perfect crystals seen, apparently from the lower regions of the air.

Lastly, there is little, beyond what has been stated, and their frequency, to distinguish between the snows observed by Captain Scoresby within 12° of the north pole, and the Lancashire snows of the past winter. "Snow," says that able author,* "is so very common in the arctic regions that it may be boldly stated, that in nine days out of ten during the months of April, May, and June, more or less snow falls. * * When the temperature of the air is within a degree or two of the freezing point, and much snow falls, it frequently consists of large irregular flakes, such as are common in Britain; sometimes it exhibits small granular, or large rough white concretions; at others it consists of white spiculæ, or flakes composed of coarse spiculæ, or rude stellated crystals formed of visible grains. But in severe frosts, though the sky appears perfectly clear, lamellar flakes [crystals] of snow, of the most regular and beautiful forms, are always seen floating in the air and sparkling in the sunbeams, and the snow which falls in general is of the most elegant texture and appearance.†"

In conclusion allow me to say, that, as a systematic examination of the snows of a season, the present one, so far as I am aware, stands almost alone. Under such circumstances, great imperfection is unavoidable. My aim has been to record intelligibly what was observed carefully, under a deep and increasing impression that an important contribution to our knowledge of the climatal relations of various regions, is to be obtained from a more minute investigation of their snows.

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* Account of the Arctic Regions, vol. i, p. 425.

† In the work just quoted the snow crystals figured are classed under five "genera," which may be described as follows:—

1. Lamellar. (Stelliform; rays in one plane.)
2. Echinose. (Rays in several planes.)
3. Acicular. (Spiculæ, or six sided prisms.)
4. Pyramidal. (Six sided pyramids.)
5. Rotate. (Lamellar crystals attached to a prism, as in fig. 39.)

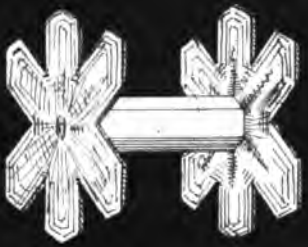
Examples of all these genera will be found in the foregoing observations.

35

36
1/20 IN

37

38



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42
1/5 IN

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If we are to arrive at sound conclusions on this most interesting subject, no means of information may be neglected. I believe this to be one full of promise, and quite "within the scope of the assumed duties" of the Historic Society, and would therefore respectfully apply to it a suggestion contained in the letter lately published by one of ourselves—*what we need is more general, systematic, and combined observation.* If the present communication, written, I trust, in the spirit of that admirable letter, shall be the means of forwarding, in this respect, the high objects for which we are associated, and to which each member should feel himself individually committed; if it shall induce more vigilant attention hereafter to these minute but altogether admirable works of Him who "giveth snow like wool, and casteth forth his ice like morsels," it will receive an ample reward.

On Institutions for the Deaf and Dumb: their Objects, Difficulties, and Advantages.*

By David Buxton, Esq.,

PRINCIPAL OF THE LIVERPOOL SCHOOL FOR THE DEAF AND DUMB.

(Read April 19th, 1855.)

Whenever the history of the present century shall be written, it will record a succession of the most signal triumphs of mind over the obstructions of matter, which have ever been achieved by man, since the Almighty Creator of the world made it subject to his dominion, and commanded him "to replenish the earth, and *to subdue it.*" (Genesis i. 28.)

To the accomplishment of these results, we have not only employed the marvellous discoveries of our own times, but have appropriated and improved upon those which had been transmitted to us from former ages. Some of these had been left by their authors, after many a weary year of painful speculation and research, little better than crude and impracticable theories.

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* The present paper originated in the offer of a Prize by the Lord Bishop of St. David's, for the best Essay upon this subject, in connexion with an Esteddfod, for the promotion of a literary object, which was held at Morriston, Glamorganshire, in September last. It was previously agreed that, if not published in the Principality, the paper should be at the disposal of the writer, for presentation to the *Historic Society.* As it received the award, it is now published, with the simple omission of some local allusions, and the substitution of other details, which seemed more appropriate to this place.

Others, though promising success, waited for the conditions which should be favourable for their application. Our fathers "laboured, and we have entered into their labours." (John iv. 38.) They investigated and discovered what we have appropriated and applied; they worked out the theory which we have reduced to practice; they ascertained what might be done, and we have done it.

For example, it was discovered as a matter of theory—and even proved as a matter of fact—more than three centuries ago, that the instruction of the deaf was possible: but the application of that discovery has been the work—as it must be admitted to be one of the honours—of the last hundred years. Though there are now not fewer than two hundred Schools for the education of the Deaf and Dumb, in various parts of the world, a century ago there was not one. Opportunities of instruction are now offered to this afflicted class in every country of Christendom; but at that time not a single individual of all the living thousands amongst them, was under instruction, nor was such an advantage attainable in any country upon earth. To what is the change owing? To the establishment of separate Institutions for the education of the deaf and dumb.

This brings us to our subject. I am required to shew what are "the objects, the difficulties, and the advantages of Institutions for the education of the deaf and dumb."

Now it is not possible that the "advantages," or even the "objects," of these schools, can be thoroughly and correctly estimated, without some previous acquaintance with the "difficulties" which have to be overcome in communicating knowledge to the deaf. And as all these "difficulties" arise out of that peculiar mental condition which results from the absence of hearing, it will be necessary that we should first see what is the natural condition of the deaf and dumb previous to instruction.

Our own experience and daily observation, shew us the relation which exists between spoken and written language. Children first learn to speak, and then to read. The words which we find in books are those which we habitually use in our ordinary conversation. But if a person cannot hear, neither can he read; for when a child learns to read, he merely learns to recognize by the eye, the written form of words, which, as vocal sounds, are already familiar to the ear. Thus it will be seen, at once, that the great

deprivation of the deaf is not merely, or so much, the exclusion of sound, as it is the complete exclusion of all that information and instruction which are conveyed to our minds by means of sound. The deaf know almost nothing, because they hear nothing. We who do hear acquire knowledge through the medium of language every hour. Language, we must remember, is a means of *im*pression, as well as the vehicle of *ex*pression. By it, we both tell what we want, and have learned what we know. The individual mind is insulated, and this is the channel of communication both *to* it, and *from* it. If we reflect upon what we know, and trace out the way in which it has been acquired, we shall find that nearly all the information we possess has come to us through the medium of spoken or written language. *Then* we shall be able to form some notion of what they have lost who cannot be addressed in either of those ways. Speech tells them nothing, because they cannot hear: and books teach them nothing, because they cannot read. One of our most common and descriptive phrases for a very iguorant person, is to say that he "can neither read nor write." But this phrase, significant as it is, utterly fails to describe the mental condition of the uneducated deaf. There are some men in every community who are well informed on many subjects, or who are, at any rate, able to pass through life, and to perform its duties, creditably, though they cannot either read or write. This is because they both hear and speak. By speech they can ask for information, and through the hearing they can receive it. But the deaf and dumb cannot do this. If, therefore, you can realize what must be the mental and spiritual state of one who can neither read nor write, nor hear, nor speak, you have then arrived at a true estimate of the natural and inevitable condition of a person born deaf, who is without education: and you will then be able to recognize the striking fidelity of the painful picture in which the eminent Prelate—whose interest and sympathy originally called forth this Essay—has described the lot of those who suffer under this calamity, as one of "neglect and destitution, of wasted faculties, of a stunted moral and intellectual growth, * * a stagnant, profitless, joyless, and hopeless existence."*

Objects.

To alleviate the burden of this sad condition is the "*object*" of Institu-

* Sermon by the Lord Bishop of St. David's, preached for the Cambrian Institution for the Deaf and Dumb, at Aberystwith, 1849, p. 19.

tions for the Deaf and Dumb. On entering school, the deaf pupil meets, for the first time in his life, with persons whom he can understand, and who understand him; he finds a mode of communication (by signs and gestures) which is intelligible to him, for it is his own natural and only mode of expressing his own feelings and wants. As it is from the want of an intelligible language that his mind has hitherto remained "undeveloped and darkened by the absence of proper moral perceptions and useful information,"* the supply of this want, even in an imperfect degree, is quickly followed by an accession of knowledge and an expansion of the mental powers. "The teacher takes advantage of this method of communication [among his pupils] to add to their stores of knowledge, to enrich and extend the sphere of their thoughts, to give them new food for the mental operations, all of which may be accomplished during the time that words, and the language of their country is imparted to them."† It is, indeed, chiefly as a means to this end—instruction in the "language of their country"—that signs are to be valued and employed; and the same end is one of the principal "objects" of the Institutions for the education of the deaf. With this view, they are taught from the first, that words convey the same meaning to our minds which pictures and signs do to theirs: they are therefore required to change signs for words, until the written or printed character is as intelligible as the pictorial representation, and the pantomimic sign. This, of course, is a long process; little more than the foundations of such a work can be laid during a few years' attendance at school; for, if the best and largest part of a man's education is that which he gives himself—and if it is a work which continues through life, to every one amongst us, how vastly is its difficulty increased in the case of one deaf and dumb, who enters school knowing nothing, and of whom it has been held, that if, after five, six, or seven years' instruction, he has as much knowledge of language as an intelligent hearing child of five, six, or seven years of age, the intervening time has been well and profitably spent both by his instructors and himself. "Give them language," exclaims Dr. Watson,‡ "and you in a great measure do away their defect, and bring them on a level with those of their age and station in life." When once they have become

* Population Tables. Census of Great Britain, 1851, Part II., Vol 1. Report, Section 5. The Blind and the Deaf and Dumb, p. cviii.

† Knight's Cyclopædia; Article *Deaf and Dumb*.

‡ Instruction of the Deaf and Dumb. Introduction, p. xviii.

masters of language, they possess the key to all those treasures of wisdom which were at one—and that the chief—"entrance quite shut out."* Their own diligence will enable them to make progress in whatever direction they may choose; all other obstacles are removed, when they are enabled to comprehend what language means, for they can then learn—if they have the disposition and the opportunity—all that language conveys.†

Another "*object*" of these Institutions is moral training. The refractoriness of the deaf is proverbial; and where it is not exaggerated, it is often to be ascribed to causes for which they are more to be pitied than blamed. But how entirely does this fault disappear under the salutary discipline of an Institution, where the evil of inconsiderate indulgence is absent, and an intelligible means of communication is employed, and the little artifices which have been successfully practised at home, are at once seen through, and have to be given up!

Further, if it is necessary to give them correct perceptions of things visible—their knowledge of which, being superficial, is often erroneous—how much more necessary is it to carry their thoughts beyond the narrow boundary of things present to those sublimer objects which "eye hath not seen, nor ear heard," neither could it have "entered into the heart of man,"‡ unillumined by the light of Divine Revelation, to conceive of. It has been well said—"that the main end of the instruction of the deaf and dumb is to prepare them for this world and the next, for life and for death."§ Indeed, if any one penetrates into the darkness of man's fallen nature with the light of life, it is the Teacher of the deaf and dumb. The mental, moral, and spiritual darkness of his pupils, when they are first placed under instruction, is deeper and more dreadful than that of any other class of the human race. Heathen in the heart of a christian country—yea, even in the centre of a christian home—love them as you may, you cannot tell them of the goodness of God; you cannot tell them of the achievements of His omnipotence, or the miracles of His mercy. This beautiful world, the dazzling sun, the glowing sky, the thrilling spectacle of night, the moving majesty of ocean, the ever-varying, never-ceasing beauty of the speechless

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* Paradise Lost. Book III., line 50.

† See Encyclopædia Britannica, page 675. Article *Deaf and Dumb.*

‡ 1 Corinthians, ii. 9.

§ Jaeger of Wirtemberg, quoted in Day's Report of the Schools of Europe. New York, 1845, p. 118.

flowers and the tuneful birds; all these, though they present a beautiful picture, are nothing more than a picture; they are as silent to the mind as they are to the ear; for any intellectual or moral purpose they almost exist in vain; while, besides and beyond all this, the nature and destiny of man are utterly unknown, and the sacred and sublime truths of revelation as blank as if they had no existence—as much so as if Adam had never sinned, and Christ had never died. Therefore, while in the work of education, the zealous teacher does endeavour to reach the minds of his pupils; to call into exercise, and to cultivate, their powers of intellect; to give them knowledge which shall qualify them for useful offices in this life; teach them to perform their social duties, and inculcate sound principles for their guidance in daily life,—the first and last "*object*" of their instruction, after all, must be to give them that higher knowledge "which maketh wise unto salvation."

Difficulties.

We come now to speak of the "difficulties" of this work. To dwell upon them fully would require that much of what has already been said, should be repeated. For, to describe the work, is to describe its difficulties. No ordinary educational process will suffice. Instruction can only be conveyed, in a peculiar manner, by men specially qualified for the work. Among many experiments which have been made, none has failed so utterly as that of trying to educate deaf and dumb children along with other children, in an ordinary school. The exposure of the fallacy upon which this was based, was the overthrow of one great "difficulty," which stood in the way of the extension of deaf-mute education. Another, was the unwillingness of persons to believe that deafness was so common as it is. But wherever enquiries were made—as they were made in Paris, Liverpool, Manchester, the city of New York, the State of Connecticut, and in the Principality of Wales, before the Schools in those respective localities were opened—the result was the same in every case; it astounded many more than the doubting, and put an end at once to the objection which it seemed so obvious to urge.

A third "difficulty" was that of obtaining competent persons to conduct these Institutions. Both before and after De L'Epée, whose disinterestedness and philanthrophy appear all the brighter from the contrast, there were teachers of the deaf and dumb, who practised their art as a mystery,

binding their associates by promises and penalties, not to divulge the knowledge which they had acquired. Of a system so humiliating, and so derogatory to the noble work which they had in hand, it is impossible to speak without shame and regret. In the present day, the case is far otherwise; and in so far as this is owing to the increase of public Institutions, it will be alluded to again, when we come to treat of the "advantages" of such establishments.

These however are "difficulties" which it may rather be said *have* hampered these Institutions, than that they are in operation at present. But the next to be mentioned is one which, though of less frequent occurrence now than formerly, is still occasionally to be met with, and is fully as inexplicable as the last. It is the reluctance of parents to part with their children for the purpose of affording them the blessings of education. Dr. Watson speaks of some in his time who "with the best intentions, have been found seriously to balance, whether they should best perform their duty to a deaf and dumb child by hoarding a sum of money that might be applied to its future maintenance, or by laying it out in its education."* And such instances have been brought to light even in our own day. Some have occurred in my own experience. Here, however, there has been the excuse of a good intention. But how shall we sufficiently condemn this unwillingness of parents, when it arises either from ignorance—which in such a case is so culpable, or from indifference, which is so criminal, seeing that it withholds their own offspring, destined to immortality, from all which would humanize, civilize, and christianize them? In the times of De L'Epée there were those who regarded deafness as an affliction so directly from the hand of God, that any attempt to alleviate it had something of the character of impiety, and later writers have mentioned a Sardinian prejudice which holds that "by educating the deaf and dumb, they are exposed to the danger of damnation, from which, left uninstructed, they would be exempt."† Objections of this class have proved real difficulties, though probably few could now be found to urge them, or to attach any weight to them. The simple obligation to instruct the ignorant, which sets them aside at once, is sanctioned as much by considerations of worldly policy, as by the solemn dictates of religious duty.

* Watson's Instruction for the Deaf and Dumb. Introd: p. xxv.

† Dr. Peet's Report on European Institutions, New York. Note p. 152, (quoting from the Fourth Circular of the Paris Institution.)

Among the number of *external* "difficulties" is to be mentioned, the fluctuating and uncertain means upon which, in this country, the Institutions for the deaf and dumb must depend for support. At their outset they generally excite much interest and curiosity, and attract a considerable amount of *impulsive* support; but when the nature of their operations becomes known, and their results familiar, this source of income is kept up with difficulty, and their capabilities of usefulness are necessarily limited in consequence. The histories of many British Institutions would bear out this statement. Yet, is it not strange, and sad as well as strange—that when the work was in its infancy, when men of the highest literary eminence regarded it as a subject of "philosophical curiosity,"* and it was universally looked upon as an enterprize full of doubt and uncertainty, it should *then* attract, and receive, a larger measure of regular support, than when its fruits have become assured, and its value has been demonstrated? Let us not forget that the deaf and dumb of our times are an *instructed* race, while those of a century ago were an untaught and scarcely civilized class. It was the half-wild, half-idiotic mute who then rambled through the village, or lurked in the town. If the men of that generation could see the things which we see, they would estimate the result far more than many do now. If we could keep vivid the contrast between the familiar fact of that day and the familiar fact of our own, the schools for the education of this afflicted class would not have so frequently to appeal for funds to enable them to keep wide open their doors, nor—note the significance of the emphatic word—nor would any one who now applies for their benefits be "sent *empty* away."

These however are "difficulties" external and accidental,—too serious and important to be omitted in an essay of this kind, but not inherent in the work itself. Of the latter class are the following:—(1.) The poverty the sign language, in comparison with that which children acquire without effort as their mother tongue. Language has therefore to be mastered, not only as an end most desirable in itself, but as a means to further progress. By giving a deaf child an equivalent word for every sign he uses, and habituating him to this process of translation, words become his mode of expression as well as ours. It is thus that every word has to be explained. But then he only knows the *forms* of words. He has not the aid of sound

* Dr. Johnson. See his Journey to the Western Islands. Conclusion.

to modify them. Consequently, before explanation is given, the verb *lead*, to guide—and *lead*, a metal, are the same. *Fit*, a convulsion, and *fit*, the adjective, meaning suitable or appropriate, are alike. And after this difficulty is conquered, and he is well acquainted with separate words, still they are only understood in their *literal* signification. But if you will consider how necessary it is, both in reading and conversation, to be familiar with the changes and modifications of meaning involved in their combination and context, in their figurative application and idiomatic use, you may approximate to some estimate of this particular "difficulty" in the teaching of the deaf and dumb. (2) Further: in thus substituting words for signs, the first efforts which the pupil makes after adequate expression, are in the order of the signs themselves—not in accordance with the conventional, syntactical arrangements of written language. Moreover, the laws of construction differ in different languages. What would be a correct form of expression in one tongue is incorrect in another. In French the noun stands before adjective; in English the relative position is reversed. The former is the order which the deaf and dumb would naturally follow,—first placing the noun, or object, and then naming the attribute or quality appropriate to it. The facts thus incidentally noticed, and which are capable of lengthened and most interesting illustration, explain those peculiarities of expression, and of construction, which are often met with in the compositions of deaf persons, however well educated. (3.) Thus they begin at eight, nine, or ten years of age, or even later, to learn that which hearing children have been familiar with from their infancy. Well may it be said that the work is difficult, the process long, the end only to be attained with the most constant application and untiring perseverance. And if years are occupied in the education of a child possessing all his faculties, who goes to school with those acquirements ready for use which the deaf and dumb have laboriously to attain,—if he, with a sufficient knowledge and easy command of language, with the faculty of attention, the power of application, and a vast unknown fund of general information already obtained,—if he, beginning from a point which the deaf and dumb will be fortunate in gaining after great efforts and long labour, still requires so long a course of instruction to fit him for the duties of life, judge you of the "difficulty" in the special work now under consideration, and then say whether close and uninterrupted, and prolonged attention are not demanded, both of teacher and pupil, in order to ensure even moderate success. (4.) Thus much on

the score of its "difficulties"—difficulties which some persons appear entirely to overlook, while others imagine them to be insuperable. The former class seem to expect that the deaf and dumb should know everything: the latter wonder that they can be taught anything. Between these opposites lies the truth—the work *is* difficult, but it is not impossible. And that the Institutions should depend solely upon the benevolence of the community in which these two classes form so large a part, is certainly not the least of the "difficulties" of Schools for the education of the deaf and dumb.

Advantages.

And what shall we further say of their "advantages," if these have not already appeared? "To restore," as Sicard has described it, "a man to society, to his family, to himself; and to restore to him society, his fellow creatures and his family,"* is no small advantage surely. To see that it is only by such an agency as has now been described, that the deaf and dumb "can be transplanted out of the dreary solitudes" of their natural condition "into an ever-widening sphere of sympathy and kindness, of mutual succour, of social enjoyment, of cheerful activity, of growing usefulness, all animated and hallowed by a moral and religious influence,"† is to have the most striking evidence of the "advantages" of these Institutions, and the strongest motives to support and maintain them. I may sum up the whole in one sentence, embracing each of the points which were to be treated of, and exclaim,—"How great must be their *advantages*, when through such *difficulties*, such *objects* are patiently worked for, and by God's blessing finally attained." This was the truth to be demonstrated, and I should be content to leave the case on the evidence now adduced, but there are a few incidental "advantages" which it would be wrong to overlook. First, there is the accumulation of trustworthy information as to the number of this afflicted class. The late Archbishop Vernon-Harcourt, of York, when applied to by the projectors of a new Institution, stated that "during his long life he had never heard of more than two persons in this melancholy condition." One of the earliest and most energetic supporters of the London Asylum, Mr. Henry Thornton, M.P., at first regarded the scheme

* "Rendre un homme à la société, à sa famille, a lui même; lui rendre à lui même la société, ses semblables et sa famille."—Sicard's Cours d'Instruction d'un sourd-muet de naissance, p. 61.

† Bishop of St. David's. Sermon for Cambrian Institution, p. 19.

as a visionary one. He had "never seen a deaf and dumb child," he said, and "thought the number would be too small to form the projected Institution." The recently published Census Report states that "great disadvantages have resulted from this entire absence of authentic information, not only to society at large, but more especially to those afflicted persons on whose behalf the appeals and efforts of philanthropy, unsupported by a reference to facts illustrative of their numbers and condition, have lost much of their intended effect.* Such an inquiry into the numbers of the deaf and dumb in this country was instituted for the first time at the Census of 1851. The tables which have been published shew, that throughout Great Britain and Ireland there were 17,300 persons deaf and dumb, out of a population of 27,511,801; or one in every 1590 individuals.† For the

* Census Report. The Blind, and the Deaf and Dumb, p. cviii.

† *Number of the Deaf and Dumb in the United Kingdom, March 31st, 1851, and proportion to the whole population, as given in the Census Returns of the Registrar General, dated 29th April, 1854, and the Report of the Census Commissioners for Ireland, dated 30th March, 1854:—*

	NO. OF DEAF & DUMB.	TOTAL POPULATION.	PROPORTION.
ENGLAND	9,543	16,738,695	1 in 1754
IRELAND	4,747	6,552,324	1 in 1380
SCOTLAND	2,155	2,888,742	1 in 1340
WALES	771	1,188,914	1 in 1542
ISLANDS in the BRITISH SEAS	84	143,126	1 in 1704
TOTAL	17,300	27,511,801	1 in 1590

Proportions in the various Local Divisions of the United Kingdom:

	NO. OF DEAF & DUMB.	TOTAL POPULATION.	PROPORTION.
NORTHERN COUNTIES OF ENGLAND	471	969,126	1 in 2058
NORTH WESTERN *i. e.* Lancashire & Cheshire	1,237	2,490,827	1 in 2014
SOUTH EASTERN COUNTIES	836	1,628,386	1 in 1948
SOUTH MIDLAND DITTO	649	1,234,332	1 in 1902
LONDON	1,325	2,362,236	1 in 1783
NORTH MIDLAND COUNTIES	694	1,214,538	1 in 1750
YORKSHIRE	1,042	1,789,047	1 in 1717
EASTERN COUNTIES	669	1,113,982	1 in 1665
WEST MIDLAND DITTO	1,325	2,132,930	1 in 1610
WALES (including Monmouthshire)	771	1,188,914	1 in 1542
CONNAUGHT, Ireland	674	1,010,031	1 in 1499
SOUTHERN COUNTIES OF SCOTLAND	1,225	1,813,562	1 in 1480
LEINSTER, Ireland	1,135	1,672,753	1 in 1474
SOUTH WESTERN, England	1,295	1,803,291	1 in 1393
ULSTER, Ireland	1,527	2,011,890	1 in 1318
MUNSTER, Ditto	1,411	1,857,650	1 in 1317
NORTHERN COUNTIES OF SCOTLAND	930	1,075,180	1 in 1156

purposes of the Census, England, Scotland, and Wales were divided into thirteen districts. The largest proportion of deaf persons is found in the northern counties of Scotland, where there are 930 deaf in 1,075,180, or one in 1156; and the smallest proportion is in the northern counties of England, where the number is 471 out of 961,126, a ratio of one in 2058. Next in numerical order to this, is our own district—the "north western counties" of Lancashire and Cheshire—which contained 1237 deaf and dumb out of 2,490,827 souls, or one in 2045.

Taken separately, there were:—

In Cheshire, 226 deaf and dumb in 423,526, or 1 : 1874

In Lancashire, 1011 „ 2,067,301, or 1 : 2045

Proportion of the Deaf and Dumb in the Counties of England and Wales:

	Deaf and Dumb, one in		Deaf and Dumb, one in
I.—London	1783	VI. West Midland Counties.	
II. South Eastern Counties.		22 Gloucestershire	1565
1 Surrey (extra metropolitan)	1947	23 Herefordshire	1054
2 Kent (extra metropolitan)	2343	24 Shropshire	1493
3 Sussex	1657	25 Staffordshire	1860
4 Hampshire	2000	26 Worcestershire	1160
5 Berkshire	1074	27 Warwickshire	2026
III. South Midland Counties.		VII. North Midland Counties.	
6 Middlesex (extra metrop.)	2215	28 Leicestershire	1958
7 Hertfordshire	1871	29 Rutlandshire	1734
8 Buckinghamshire	1614	30 Lincolnshire	1870
9 Oxfordshire	2027	31 Nottinghamshire	2088
10 Northamptonshire	1828	32 Derbyshire	1272
11 Huntingdonshre	3016	VIII. North Western Counties	
12 Bedfordshire	1754	33 Cheshire	1874
13 Cambridgeshire	1845	34 Lancashire	2045
IV. Eastern Counties.		IX. Yorkshire.	
14 Essex	1490	35 West Riding	1640
15 Suffolk	1724	36 East Riding (with York)	2231
16 Norfolk	1785	37 North Riding	1754
V. South Western Counties.		X. Northern Counties.	
17 Wiltshire	1426	38 Durham	2480
18 Dorsetshire	1406	39 Northumberland	1818
18 Devonshire	1410	40 Cumberland	1917
20 Cornwall	1278	41 Westmoreland	1622
21 Somersetshire	1448	XI. Monmouthshire & Wales.	
		42 Monmouthshire	2300
		43 South Wales	1423
		44 North Wales	1514

Coming to the still narrower limit of our own town and neighbourhood, we find that the Liverpool and West Derby districts contained 180 deaf

NORTH WESTERN DISTRICT.

(*Lancashire and Cheshire.*)

REGISTRATION, &c.	POPULATION.	DEAF AND DUMB.	PROPORTION, ONE IN
VIII. North Western Counties.	2,490,827	1237	2014
33 Cheshire	423,526	226	1874
34 Lancashire	2,067,301	1011	2045
Districts.			
33 *Cheshire.*			
452 Stockport	90,208	48	1879
453 Macclesfield	63,827	38	1666
454 Altrincham	34,043	22	1547
455 Runcorn	25,797	18	1433
456 Northwich	31,202	16	1950
457 Congleton	30,512	20	1525
458 Nantwich	37,986	22	1726
459 Gt. Boughton	53,294	29	1837
460 Wirral	57,157	13	4396
34 *Lancashire*			
461 Liverpool	258,236	*139	1858
462 West Derby	153,279	41	3738
463 Prescot	56,074	28	2002
464 Ormskirk	38,307	13	2946
465 Wigan	77,539	45	1723
466 Warrington	36,164	13	2782
467 Leigh	32,734	14	2338
468 Bolton	114,712	50	2294
469 Bury	88,815	40	2220
470 Barton-upon-Irwell	81,585	+100	316
471 Chorlton	123,841	45	2752
472 Salford	87,523	35	2500
473 Manchester	228,433	95	2404
474 Ashton-under-Lyne	119,199	57	2091
475 Oldham	86,788	42	2066
476 Rochdale	72,515	22	3296
477 Haslingden	50,424	20	2521
478 Burnley	63,868	40	1596
479 Clitheroe	22,368	19	1177
480 Blackburn	90,738	37	2455
481 Chorley	37,701	26	1450
482 Preston	96,545	41	2355
483 Fylde	22,002	9	2445
484 Garstang	12,695	6	2116
485 Lancaster	34,660	20	1733
486 Ulverstone	30,556	14	2182

* "Including 32 inmates of a school for the deaf and dumb." The day-scholars of the Institution and absentees would, of course be taken at their own homes. The Education Census gives 56 as the total number of scholars at that time; it is now 80—55 of whom belong to Liverpool.

+ "Including 81 inmates of an institution for the deaf and dumb." This, though locally situate in another district, is the Manchester School for the Deaf and Dumb.

mutes in a population of 411,515; or one in 2286. There were 189 in Liverpool, and 41 in West Derby. The pupils in the local school were returned as 56, but of these, 24 were taken account of elsewhere. Twenty-two of them being day scholars, were reckoned at their own homes in the town, and two boarders from a distance were also absent. Of the remaining 32 who were in residence on the Census Sunday, there were 17 who did not belong to Liverpool. Deducting these, the number of the local deaf and dumb falls from 180 to 163, and this alters the proportion in the parliamentary borough to one in 2524. In this county, with a comparatively small deaf and dumb population, we have extensive provision made for their education. In March 1851, there were 136 pupils in the two Schools of Liverpool and Manchester. That number is now increased to more than 160. But it must be borne in mind that, on the one hand, wherever there are schools for the deaf and dumb, the aggregate of the deaf mute population will seem larger than it really is, and on the other, where there are no schools it will seem relatively smaller. Of the 56 pupils returned at the Liverpool School in 1851, 19 came from a distance: of the 80 now upon the books, about one-fifth belong to places which lie outside the boundaries of Lancashire and Cheshire. Thus, the children who are under education swell the proper population of the districts where schools are situate, and reduce that of the places where their own homes are. It follows, that those children of the educable age, who are returned in any place where there is no school, are those who should have been at school; and if these could all be collected into one total, it would shew precisely (allowing for a few cases of absence from illness, and other casualties,) the number of those who being of the eligible age for receiving education, were growing up without education.

Of those computed to be of the proper age, there were actually under instruction, only 34½ per cent. in Ireland, 50 per cent. in England, and 70 per cent. in Scotland.* I shall be much mistaken if at the next Census England does not stand in a very different position from that which these figures represent. If for the want of trustworthy evidence upon a subject so important, the case of the deaf and dumb has not hitherto received the

* See a Paper, by the Writer, on the *Census of the Deaf and Dumb in* 1851, read at the meeting of the British Association in Liverpool, September 1854, published in the 'Journal of the Statistical Society of London," for June 1855, and quoted in the *Edinburgh Review*, No. 207, for July, 1855.

attention and sympathy to which it is so eminently entitled, the publication of the Census returns may fairly be expected to work an advantageous change in this respect. The collection of such evidence is an "advantage" which everyone will be ready to acknowledge, and it is one which I have no hesitation in claiming as, both collaterally and directly, a result of the establishment of separate Institutions for the education of the deaf and dumb.

Another great "advantage" is the raising up of a supply of competent men to take the management of the various Institutions. When the founder and first principal of the American Asylum at Hartford, came to this country in 1815, to obtain the requisite instruction for entering upon his work as a teacher, the discouragements and obstacles which he met with were such as led him to repair to France, and seek the assistance he required at the Paris Institution, where he speedily obtained it. "The Committees of the Dublin, Birmingham and Liverpool Institutions have at different times experienced such difficulties" also.* "Mais nous avons changé tout cela." That day is past. At the present time, six of the former assistants of the London Asylum are in positions where they have the sole management of establishments for the education of the deaf and dumb. Three of the present Principals of Schools in Great Britain were formerly assistants in the Yorkshire Institution: two commenced their career as teachers in the School at Glasgow: and the higher offices in other Institutions are held by gentlemen who acquired their knowledge and experience in the subordinate posts of the same establishments which they now superintend.

Finally, we must recur to the fact which was stated at the outset, the honourable distinction which belongs to the present century in relation to this work of teaching the deaf and dumb. It has not been by inventing the art, or by raising up the first of those who practised it, that the distinction has been gained, but by founding and supporting PUBLIC INSTITUTIONS for this benevolent purpose. De L'Epée, whose attention was first drawn to the subject in 1754, had his school in full operation in 1760. In 1793, four years after his death, it was adopted by the French Government, and now exists as the Imperial Institution of Paris. In 1760, also, Mr. Thomas Braidwood opened a private school in Edinburgh, (the one which Dr. Johnson visited in 1773, and the name of which, *Dumbie Dykes*, the author of

* "Knight's Cyclop:" article *Deaf and Dumb*.

Waverley has made imperishable).* Mr. Braidwood subsequently removed to Hackney, near London, and the first public Institution in this country was opened in the metropolis in 1792, under the superintendence of Dr. Watson, whose work has been previously quoted. In the year first mentioned, 1754, exactly one hundred years ago, Samuel Heinicke undertook to teach a deaf and dumb boy, at Dresden, and after continuing to pursue the work in a private capacity for several years, the Elector invited him to Leipsic, where, in 1778, the Royal Institution of Saxony was founded, being the first school for the deaf and dumb ever established or supported by civil government. In 1815, Mr. T. H. Gallaudet, a Theological student in the College of Andover, Massachusetts, resolved to "undertake the employment of instructing the deaf and dumb in his native country."† With this view, he visited Europe, as has already been mentioned, and in 1817, the "American Asylum" was opened, under his management, at Hartford, Connecticut.

From these beginnings have arisen within a hundred years, two hundred schools for the deaf and dumb. In Great Britain and Ireland there are 20 Institutions, containing 1400 pupils;‡ in the United States 16, with 1200 pupils;§ in Austria, Prussia, and the smaller Kingdoms and States of Germany, there are about 70 different Institutions; in France, 50; in Italy, 10 or 11; the same number in Switzerland, and also in Holland and Belgium; 5 in the Danish dominions; 3 in Russia and Poland; and one each in Spain and Portugal. If to these were added the various private schools in existence, the number of two hundred would be exceeded. And notwithstanding the inconvenience of absolutely depending upon variable and uncertain sources of income, it is a gratifying fact, (which I had the opportunity of first bringing before the *Historic Society* last year,) that as large a sum is raised by voluntary liberality, for the education of the deaf and dumb, in Great Britain and Ireland, as is derived from the public funds in France and the United States, for the same purpose.‖ A handsome

* See "Heart of Mid Lothian," Note E.

† Journal. Barnard's *Tribute to Gallaudet*, p. 117. Hartford, 1852.

‡ Glasgow Report, 1854.

§ Dr. Peet's address at New York, November 22, 1853. The succeeding figures are taken from various authorities.

‖ The amount is about £24,000 per annum. The *Bienfaiteur des Sourds-muets* (Paris) for November, 1854, remarking upon my statement last year, quotes Dr. Peet, of New York, as contradicting it. But the writer fails to see that Dr. Peet and I were speaking of two very different things. He spoke of the British *Government* as doing nothing; I say of the British *people*, that they do everything. There is no contradiction here, but the most perfect consistency.

proportion of this amount accrues from the investment of legacies, and it was a wise and benevolent saying of Dr. Chalmers, which, in dealing with this subject, I feel bound to reiterate—"that a provision for the deaf and dumb was one of the best subjects for a bequest that could well be imagined."

Thus, by the agency of these Institutions, education has not only been afforded to vast numbers who must else have lived and died, as did their predecessors for so many thousands of years, without a knowledge of God, or a hope of immortality; but this inestimable advantage has also been secured—*the education of the deaf and dumb has become a permanent social institution.* In its behalf have been enlisted the resources of science, the dotations of piety and benevolence, the labours of the patient and persevering teacher, the prayers and benedictions of the devout; and upon the work supported by these means, and prosecuted in this spirit, has descended God's rich blessing, whereby many have been brought out of a deep and melancholy darkness into the glorious light of the gospel—raised from the saddest ignorance to know Him "who during his abode on earth went about doing good—who did good in that particular species of distress in which these charities attempt to do it—and who, seated now at the right hand of God, sends down His blessing upon those who follow His steps, and accepts the good that is done to the least of those whom He calls His brethren as done unto Himself."*

An Account of the Life and Writings of the late J. H. Swale, of Liverpool.

By T. T. Wilkinson, F.R.A.S., &c., &c.

(Read 17th May, 1855.)

Among the many Geometers who cultivated the ancient Geometrical Analysis in Lancashire, towards the close of the last, and for a considerable portion of the commencement of the present century, none was more distinguished than the late John Henry Swale, of Liverpool. His name is still familiar to all those who admire the beauties of the Greek Geometry, and the extent of his contributions to our local and other periodicals, is well known to every one acquainted with the then numerous publications, either wholly or partially devoted to the extension of mathematical science. He,

* Bishop Horsley's Sermon for the Deaf and Dumb Asylum, 1796.

however, never seems to have been desirous of exhibiting his rare powers of analysis from motives of mere display, nor did he ever care to compete with others in matters of difficulty, unless they related to novelty of principle or simplicity of result. Under these circumstances, we need not be surprised that his contributions are somewhat irregular, both as to time and place, yet as one of his admirers (Professor Davies) has well remarked—"wherever we see the name of Swale, we are sure to meet with something new and elegant, always worthy of himself, and often with specimens of unequalled resource and unexampled method of research."

Mr. Swale was born at Bishopsthorpe, near York, October 16th, 1775. His parents occupied a respectable position in life, and sent their son to receive the rudiments of his education in several of the many respectable academies then established in Yorkshire. After a successful course, during which his superior talents not unfrequently manifested themselves, he was engaged as Assistant Master in Mr. Sanderson's Classical, Mathematical, and Commercial Academy, at Becca Lodge, near Aberford. He subsequently held similar situations at Leeds and Chester, but in the early part of 1805, he was successful in obtaining the mastership of the Town School at Idle, near Bradford, which, in addition to a permanent income, supplied a suitable residence for the accommodation of the master. This led to his marriage with Miss Sanderson, the daughter of one of his former employers, on the 8th of March in the same year, and in 1810 he removed to Liverpool, where he continued to reside until his death.

His taste for mathematical investigations manifested itself at an early period; for before he was quite twenty years of age, he had begun to correspond with the editors of the *Yorkshire Repository*, the *Scientific Receptacle*, and the *Geometrical Delights*. Some of his earliest compositions most probably appear in these periodicals. They are usually dated from Becca Lodge, and contain manifest indications of latent genius, since one of these early printed specimens relates to the determination of the proportion existing between the force of gravity on the earth, as compared with that on the surface of Uranus, which he finds from Herschel's data to be nearly in the ratio of 6. 7. Nor did he confine himself at this time to mathematical speculations only, but took up various subjects in the philosophical and poetical departments of the periodicals, most of which he treated in a very lucid and satisfactory manner.

Among the earliest of the printed pieces of this description may be instanced a poetical answer to the Prize Enigma, in No. 9 of the *Scientific Receptacle*, and several answers to philosophical queries in previous numbers. When replying to a query proposed by the Rev. Anthony Collins, of London, he assumes the signature "*Philologus*," and accounts for the phosphorescent qualities of stale fish, when viewed in the dark, by supposing that "the light in question consists in certain vibrations of the electric fluid;" but in succeeding numbers he appears under his real name, where he endeavours to remove a difficulty experienced by Mr. Thomas Crosby, of York, in chap. ix., v. 2, of St. John's Gospel, by quaintly advising him to "take the trouble to consult the next verse." The higher apparent temperature of springs during the winter season is also accounted for by him on the ground that the difference of temperature in question "proceeds from evaporation and other causes depending on heat. In all evaporations from fluids, a degree of cold is always produced in consequence of it; but the evaporation from wells, &c., in summer is very great, and in winter but small. Therefore, a less degree of cold, as a necessary consequence, becomes perceptible."

On the whole, however, it may be observed that his communications to the *Yorkshire Repository*, the *Receptacle*, and the *Delights*, are generally of an elementary character, and although the printed solutions to the mathematical questions display a neatness of method not usually found in juvenile compositions, they contain but little in themselves to indicate the superior talents of their author. From the variety of questions he answered in successive numbers, we may safely infer that the ingredient of *perseverance* was not wanting in his character. He evidently possessed this secret of success in an eminent degree, and an additional stimulus to greater exertions was supplied by Mr. Whiting, when he awarded the prize of ten copies of the *Receptacle* "to Mr. J. H. Swale, for [having furnished] the greatest number of correct solutions" to the questions proposed in the numbers for 1794. From this period, Mr. Swale's contributions to the mathematical periodicals became very extensive, and his geometrical investigations soon displayed so much superiority, when compared with those of most of his competitors, that the editors of existing, and the originators of new, scientific periodicals, were always anxious to secure his services, and looked upon him as one of their most powerful auxiliaries. During the time of his residence in Yorkshire, that county numbered amongst its private teachers

some of the most distinguished non-academic geometers of the last and present centuries. In proof of this, it is only necessary to mention the names of Mr. John Ryley, the *Ferdinando*, the *Rylando*, and the *Rev. Mr. Brookes*, of the mathematical periodicals, afterwards editor of the *Leeds Correspondent*, and who has deservedly been styled by the late Professor Davies, "the father of the Yorkshire School of Geometers;" Mr. Richard Nicholson, then of Leeds, but latterly of Liverpool; Mr. William Shepherd, of Bradford; and Mr. John Whitley, of Huddersfield.

Mr. Swale formed a very early intimacy with Mr. Ryley, and their friendship only terminated with the death of the latter. In 1802 or 1803, he first met Mr. Whitley, in company with several others, at the house of his friend, and these periodical gatherings were continued for many years. The union of so many kindred minds could not but be productive of some definite result, for to these early associations we may reasonably attribute the origin of Mr. Swale's subsequent partiality for the study of the ancient forms of pure geometry, to the neglect of almost every other branch of mathematics. In after life, these intimacies were frequently referred to with characteristic feeling. The expression "by my early friend Mr. Ryley," is appended to some geometrical speculations, bearing date August 30th, 1828; and at their conclusion he remarks—"I linger among these problems and sketches as the pleasing, yet melancholy, reminiscences of days for ever gone, and of an early acquaintance now silent and mouldering in the tomb." His acquaintance with Mr. Nicholson commenced about the year 1795, when both were in active correspondence with several mathematical periodicals. A similarity of tastes served to knit them closely together, and their friendship continued uninterrupted after their removal to Liverpool, until the death of Mr. Nicholson in 1811. Several years later, Mr. Swale drew the attention of mathematicians to the talents of his friend, by reproposing in the *Leeds Correspondent* a question from the *Mathematical Companion*, which he thought had been treated by the correspondents to that work with unmerited neglect. It belongs to a class of Geometrical Loci, intimately related to the properties of the Complete Quadrilateral, which had previously been partially discussed by La Hire and Maclaurin. Mr. Swale's investigation is conducted with all the elegance peculiar to himself, and besides generalising the property and deducing several interesting Porismatic relations, he gives his reasons for again proposing the subject for reconsideration.

At a subsequent period, the prize question in the *Mathematical Companion* for 1800 is reconsidered by Mr. Swale, in one of his manuscript volumes, and as this question had been proposed by Mr. Nicholson, his thoughts naturally reverted to their early acquaintance; hence, at the close of an improved solution, he again bears testimony to the merits of his friend, whom he styles "my early mathematical associate, thirty-three years ago, when we used to meet at Mr. Ryley's, to converse on mathematics."

The numerous intimations which occur in Mr. Swale's manuscripts, naturally produced a desire to rescue from oblivion some of the communications which passed between the able mathematicians previously enumerated; but, upon due inquiry, it appears that in one case none of them have been preserved, and in another that an accidental fire has destroyed the parcels of letters containing this very correspondence. This is indeed a circumstance much to be regretted, since the following draft of a letter to Mr. Whitley, preserved in one of the manuscript volumes, furnishes abundant grounds for supposing that Mr. Swale's mathematical correspondence possessed features of more than ordinary interest.

"Idle, 9th February, 1809.

Dear Sir,

I have purposed for some time to trouble you with one of my scrawls on some mathematical trifles, which I do not *clearly* comprehend. I am, first of all, not satisfied that I understand the notation employed in your own question, * * * and would thank you to enlighten my understanding, as the Prayer Book devoutly says. Question 29, in the *Mathematical Companion* for 1809, requires us to inscribe a triangle in a given circle, so that its sides shall pass through three given points, which you must be aware has been repeatedly done. I do not mean to say that it can be solved by no other methods than what have already been adopted by geometricians; but we must allow that Mr. Lowry's *general* method of inscription [given in his solution to Question 210 of Leybourn's *Mathematical Repository*, new series,] is sufficiently elegant. Yet I like attempts in the solution of problems upon *different* principles. The plodding ancients please me on that account, for they never laid aside a subject until they had completely exhausted it.

I have discovered a general method of inscribing polygons in a given circle, each side passing through a given point; it is also applicable to the ellipse. I thought of it long ago, but I had laid aside the inquiry, and had not your problem made its appearance, I should most probably never have resumed it.

I am pleased with your other question * * * *harmonicals* upon which it depends present a wide and pleasing field to the geometer. Among other subjects, I have lately collected and considered several problems upon geometrical loci; give me leave to present one to your notice,

to which I should like to have your demonstration, to compare with my own. * * * * * When a circle and a right line are given in position, can you determine a point in the circumference of the circle, from which a tangent being drawn; the segment of the tangent intercepted between the point of contact, and the line shall be given in length? The enunciation you will excuse, provided you can comprehend me; we may sometimes dispense with elegance in familiar correspondence.

I add my sincere respects to an old friend; remaining ever yours,

J. H. SWALE."

To Mr. Whitley.

The inscription of a triangle, or any polygon, in a given circle, subject to the condition that its sides shall pass through given points, has occupied the attention of many eminent geometers. That particular case when the points range in a straight line is considered by Pappus in his *Collectiones Mathematicæ*, and his form of the Lemma was first generalized by Dr. Robert Simson, in 1731. It next found its way into the *Mathematical Repository* for 1799, where it was considered by Professors Lowry and Wallace; the former of whom generalized the problem for *any* polygon in the same serial for 1806. Since that period, the same inquiry, in one or other of its forms, has engaged the attention of Messrs. Swale, Hearn, Gaskin, Potts, Townsend, Lamè, Puissant, and Triau, several of whom have employed the coordinate methods with good effect, both to the original problems and also to their extension to the conic sections. Mr. Swale's discussion is wholly geometrical. It is contained in the second and last number of the *Liverpool Apollonius*, where it forms undoubtedly one of the most remarkable portions of that extraordinary work. This paper on the "Inscription of Polygons in Circles," and also that on their "Inscription in other Polygons," however, did not appear until 1824, but the preceding letter to Mr. Whitley, puts it beyond a doubt that in 1809 Mr. Swale was not only in possession of his method of inscription, so far as regards the circle, but also of its extension to the case of the ellipse. Professor Davies, in his "Historical Notices respecting an Ancient Problem," printed in the third volume of the *Mathematician*, has enumerated and commented upon the labours of Castillon, Lagrange, Fuss, Euler, Lhuilier, Ottajano, Malfatti, Carnot, Gergonne, Servois, Brianchon, and Poncelet, in the same field of geometrical investigation; and yet after a most careful analysis and comparison, he characterises the whole of Mr. Swale's essay as one of "great elegance, originality, and importance." Its constructions

for three, four, five, and six points, are peculiarly neat; whilst the *general* case is attacked at once with his usual skill and adroitness; nor is he less happy in his efforts when pointing out the special cases of the quadrilateral, and when the points are situated in a right line.

In the early part of Mr. Swale's career, he forwarded some interesting communications to the *Gentleman's Diary*. His name is there associated with those of Hilton, Cunliffe, Wildbore, Gough, Dalton, Lowry, Nicholson, Campbell, Skene, Whitley, &c., all of whom stood high in the estimation of the mathematical public; and although he was then but young in science, his solutions will seldom suffer by being placed in comparison with those furnished by more experienced contributors. On the establishment of the *Mathematical Repository*, the editor enlisted Mr. Swale into his service, when he not only supplied the earlier portion of that extensive periodical with numerous articles written by himself, but on several occasions, he undertook the task of inducing others to become contributors. In the old series of this work he gave demonstrations to a considerable number of Dr. Stewart's *General Theorems*, and also to the majority of those which have usually, but erroneously, been termed Lawson's *Geometrical Theorems*, from the circumstance of his having published them collectively at the end of his valuable *Dissertation on the Geometrical Analysis of the Antients*. The notation he adopted when discussing the "General Theorems" was in accordance with that of Dr. Stewart himself, but its cumbrousness necessarily precluded any very decided success in the endeavour to extend his system of inquiry. His solutions to Mr. Lawson's collection are remarkable for their brevity and neatness, and in these respects are fit companions to those inserted from Messrs. Campbell, Lowry, Nicholson, and others. None of these writers, however, seem to have been aware whence the Rev. John Lawson derived the greater portion of the materials for his beautiful collection, if we except a writer who veiled his real name under the disguise of the signature "*Peletarius*." All the solutions furnished by this gentleman are given under the strict forms of the ancient geometry, the analysis and synthesis following each other step by step in reverse order, but, in fact, are nothing more than literal translations from Dr. Stewart's *Propositiones Geometricæ*, the original source whence Lawson had transcribed nearly all the Theorems which pass under his name!

Although after Mr. Swale's removal to Liverpool, the duties of his Academy in Brunswick Place prevented him from maintaining an extensive

mathematical correspondence, yet throughout the whole of his life he occasionally contributed to most of those periodicals which had been the means of establishing his character as a geometer. In 1823 he dedicated the first portion of the *Liverpool Apollonius*, of which he was both editor and proprietor, to "Thomas Leybourn, Esq., Professor of Mathematics in the College at Sandhurst—the ardent, persevering, and able promoter of mathematical science, as a token of grateful recollection of thirty years correspondence;" and ten years later, in one of his memoranda, he records his undiminished attachment to this worthy veteran in science.

When the publication of the *Student* was commenced at Liverpool, Mr. Swale was ready with a helping hand. He furnished solutions to most of the questions in the first two numbers of "that work of rare merit," and proposed several others; but his removal from Leeds to Chester, with other engagements, prevented him from continuing his correspondence to the remaining portion of this periodical. He, however, subsequently formed a personal acquaintance with the editor, Mr. William Hilton, who was originally resident in Saddleworth, near Manchester—a pupil of Wolfenden, and an able correspondent to most of the periodicals of his time. Mr. Swale was ever happy in the company of kindred souls, and Hilton's partiality for the "divine geometry," formed an additional motive for a close attachment. "This day, 8th May, 1826," says he, in one of his memoranda, "poor Hilton fell dead from his chair. Such is the fate of man!" The sudden termination of his friend's earthly career is elsewhere alluded to in nearly similar expressions, nor are these the only memorials he recorded of the uncertainty of human existence, for on a subsequent occasion he remarks, "this day, 28th August, 1833, confirmed the death of poor Tom Briggs, my early mathematical pupil, and the son of my old friend Dr. Briggs. With many of his colleagues in Lander's expedition, in which he engaged as physician, he perished in some part of Africa, by malignant fever." When recording the severance of domestic ties by the rude hand of death, his remarks on every occasion bear ample testimony to the humanity of his disposition, and confirm the unanimous testimony of his associates, that he was ever the dutiful son, as well as the kind and indulgent father. His anxiety for the welfare of his own offspring, was not exceeded by his desire to secure the comfort and happiness of his parents. Their removals by death are duly noted in his memoranda, and when subsequently alluding to the respective dates of June 8th, August 12th, and September 11th, he

feelingly remarks—"these with me are sad and melancholy days of bereavement, on which died a fond mother (1813), an affectionate sister (1825), a kind and aged father (1826), and my firstborn beloved daughter (1834)."

Mr. Swale's first contribution to the *Gentleman's Mathematical Companion* appears in the third number of that work. In 1802 and 1807, he obtained "Prizes of twelve *Companions*," for superior solutions, but owing probably to the neglect complained of with regard to Mr. Nicholson's question, he ceased to be a contributor in 1812. During the editorship of Mr. William Davis, his geometrical investigations extended to a considerable length; many of them were selected to fill the post of honour, and not a few are peculiarly distinguished for their elegance and originality. A close intimacy necessarily sprung up between the editor and himself, in consequence of this extensive assistance, which ended only on the premature death of the former. In an extract from one of his "Mathematical Books" he observes, "I received a letter from Mr. John Hampshire, mathematician, London, written at the request of Mrs. Davis, acquainting me with the death of my much esteemed friend, William Davis, editor of the *Mathematical Companion*. On the receipt of Mr. Hampshire's note, I transmitted the following to the *Leeds Mercury*:—Died, on February 8th (1807), at his house in Aldersgate Street, London, Mr. William Davis, who united to the high character of a honest man, that of a zealous friend to science. Besides several *original* productions which he has given to the world, we are indebted to him for an edition of the *Principia of Newton*, and the invaluable volumes of *Maclaurin* and *Simpson*. His private, social, and literary worth, will live in the affectionate remembrance of his acquaintances and friends—one of the most sincere of whom pays this humble tribute to his memory."

The geometry of the *Mathematical Companion* possesses all the characteristics of the Lancashire and Yorkshire schools; for although its voluminous pages will afford almost every variety of problem, treated according to the strict forms of the ancient Greek models, a large proportion of each successive number will be found to be devoted to the construction of plane triangles, from given data. The consideration of porisms, loci, inclinations, tangencies, sections of ratio and of space, indeed, occurs at intervals; but they occupied only a very small share of the attention of these self-taught geometers. Many of them are well known to have prided themselves upon

being able to analyze and deduce constructions from every possible combination of the given entities; and since this ability necessarily presupposes an extensive acquaintance with the properties of the plane triangle, its inscribed, circumscribed, and escribed circles, many of their discussions are still valuable in consequence of the abundant harvest of properties which they yield to the geometrical student. In the present state of science, however, the almost exclusive use of the co-ordinate methods and their greater power in overcoming the difficulties of the higher geometry, have led many to consider the labour which has been bestowed upon these isolated problems to be almost as unprofitable as it is immense; and from certain points of view, such is undoubtedly the fact. At the same time, it must not be forgotten that the practice was in strict accordance with the fashion of the times, and that even this misdirected energy no less proves the ability of those who cultivated the ancient geometry under this *now* somewhat objectionable form, than would have been the case had they devoted themselves to more prolific or useful subjects of investigation. Every isolated problem necessarily requires a totally different course of analysis, proceeding step by step, from the data given by the proposer, to others required to be determined, before the construction can be deduced; and this process not only demands the exercise of the most skilful artifices at the command of the geometer, but a ready application of all the known properties of the diagrams under discussion.

So far as regards the treatment of Geometrical problems, the writings of Whitley, Butterworth, and Swale, may be cited as indicative of the engrossing topics of both the Lancashire and Yorkshire schools, as well as of the prevailing taste at the period of which we speak. The modes of analysis adopted by the two former geometers are in general well suited to the circumstances of the propositions to which they are applied; but with regard to fertility of invention and variety of resource, they are in many cases decidedly inferior to those furnished by the latter. In these respects both his published and his manuscript writings fully confirm the accuracy of the opinion expressed by the late Professor Davies, that "a familiar acquaintance with the works on geometry which have been published in this country during the past and present century has led to the conviction, that Mr. Swale was undoubtedly the most independent and original geometer of his time. Everything he wrote was more free from the impress of the writings of others, even where the subjects are the same; and so elementary too,

that we should hardly suppose it possible for two different methods to be purposed, than I find to be the case with any other geometer except Dr. Matthew Stewart. Swale's geometry, in fact, was his own invention, for he was singularly unacquainted with the writings of other geometers, even of the English school." *(Mathematician, Vol. iii, p. 317.)*

When the *Leeds Correspondent* was established in 1813, Mr. Swale did not neglect to render it his countenance and support. In 1822 he was awarded the "prize of six correspondents" for his solution to the prize question which had been proposed by himself. The fact of the mathematical department being successively under the superintendence of his early friends and associates, Messrs. Ryley, Gawthorp, and Whitley, naturally induced him to take a lively interest in the success of the work; and hence some of the most beautiful specimens of his methods of treating geometrical problems found their way into the several volumes of this valuable periodical. One of the most interesting of these which requires us "to describe a fourth circle to cut three other given circles, so that the three chords joining the points of intersection shall pass through three given points" has recently been reproposed as the prize question in the *Lady's and Gentleman's Diary* for 1851; where it forms an excellent illustration of the application of the properties of radical axes to such inquiries. In the last number of the *Correspondent* he proposed a porismatic case of Pascal's hexagram as the prize question, but for some unexplained reason, he neglected to forward a solution in time for publication. This omission appears to have been the cause of a little embarrassment to the editor, for after giving his own discussion of this "porismatic *double entendre*," he formally announces that "in future no new questions will be inserted, except those which are accompanied by correct solutions from their respective authors."

We have now arrived at the period when Mr. Swale published his *Geometrical Amusements;* a work which had been announced some time before, at the close of one of his solutions in the *Leeds Correspondent.* They made their appearance in December, 1821, as the first part of a "Course of Lessons in Construction and Analysis; containing a general problem and solution, with its application to a series of Geometrical Inquiries." The work is divided into three books, which were dedicated to "John Leslie, Esq., F.R.S.E., and Professor of Natural Philosophy in the University of Edinburgh; as a public Testimony of esteem for his worth AS A MAN, and for his distinguished Talents as a Geometer." They

were also "presented to the Disciples of Euclid" in order "to familiarise a class of Problems, in themselves extremely beautiful; and interesting to geometricians from the simplicity, elegance, and comparatively unlimited range of which they are susceptible in their application to the resolution of other Geometrical researches." As introductory to the course, he premises the General Problem of "having two points and three right lines given in position; to draw from the given points two right lines intersecting each other at a point in one of the lines given in position, and making equal angles with the two remaining lines given in position," as a "basis to which the three Books are referable for solution;" but with regard to the solutions themselves, he observes, that "nothing further has been attempted than a transcript of the contents of the geometrical lecture-slate; with some degree of attention to that natural arrangement which position and consequent inference seemed to point out." The first eight pages of the *Amusements* are devoted to the consideration of several particular cases of the general problem. He then gives Book I., which contains twenty-six carefully selected examples in Construction and Demonstration, amongst which are the properties of *Radical Axes*, together with several cases of *Determinate Section* and the *Section of Ratio* of the ancients; for both of which, he observes, "we are indebted to the fertile genius of Apollonius, the celebrated geometrician of Perga." "Having given in construction a sufficient number and variety of examples to shew the extent and facility of application of the general problem and its auxiliaries," he then proceeds to Book II., which embraces a series of thirty "appropriate and diversified sketches of Analysis;" and this is followed by Book III., or the "Intellectual Gymnasium," which opens with an arrangement of the problems that have been deduced during the preceding inquiries. A selection of "Additional Problems, Generalised and Original," forms an appropriate conclusion to this remarkable work, and offers an inviting field for the exercise of the ardent geometer. Throughout the whole of the analyses and constructions the author never loses sight of the connexion which exists between the general problem and each successive deduction. In the earlier portion of the work he reminds the reader that he is "not aware that any other problem, so generally applicable to composition, can be found in the whole compass of plane geometry," and at the close of its application to no fewer than *one hundred and ninety* examples of every grade of difficulty, he proposes as an exercise for the student that he shall

prove "by analysis, that all the problems in Books I. and II. may be determined by the general problem." Of the *nature* of the contents of the volume it is almost unnecessary for us to speak. The late Professor Davies has pronounced the work to contain "some of the most elaborate and elegant geometry, conceived in the true spirit of the ancients, (but perfectly unshackled as to any anterior works,) that exists in our language, or probably in any language whatever." In his *Solutions to Hutton's Course of Mathematics*, he terms it "the most remarkable book of modern times" and one from which the student "will acquire more power of original research than from any work he could place before him." Again, when reviewing some of its contents in his "Historical Notices," he declares his opinion that "the *Geometrical Amusements* is undoubtedly one of the most original and remarkable works on Geometry that has appeared since the time of Stewart and Simson." Some idea may be formed of the estimation in which he held Mr. Swale's publication when we state that having failed in his efforts to procure a copy through the usual channels, he borrowed the work from his friend, Mr. Samuel Ryley of Leeds, and transcribed the whole of its contents. Strongly expressed as these eulogiums may appear to some, it is certain that they do not exceed the truth. His published works fully justify the terms made use of in the preceding extracts, while those still remaining in manuscript present ample proofs of a genius in geometry which has seldom been surpassed. The methods of treatment, the fertility of invention, and the almost unique elegance of the analyses and constructions, combine to place Mr. Swale in the first rank amongst the cultivators of the Ancient Geometrical Analysis. The page of errata prefixed to the volume contains the announcement that Parts II. and III. were ready for the press and would appear in succession, but failing health and the limited sale of Part I. did not justify the completion of his design. In addition to the general merits of the work we may also observe that the style of printing contains several peculiarities. As we have formerly observed *(Phil. Mag.* 1852*)* "up to the time when the *Amusements* were published no attempts had been made to improve the style of printing geometrical investigations. The old hacknied form had been rigidly adhered to by both editor and author; nor had any geometer appeared who had ventured to deviate from the established usage of carrying the type entirely across the page. Mr. Swale, however, had learnt that the *eye* had something to do in geometry as well as the *intellect*, and in his

anxiety to assist *both*, he adopted to a considerable extent the practice of printing each step of the syllogisms in a separate line, which has since been carried out so successfully by Mr. Potts in his excellent editions of *Euclid's Elements*. The pages of the *Amusements* therefore presented a somewhat novel appearance to the geometers of the time, and this, together with his habit of composing scraps of verse, induced them to banter him occasionally respecting his *poetical* geometry."

"*The Liverpool Apollonius*, or the *Geometrical and Philosophical Repository*," Parts I. and II., were published in 1823 and 1824 respectively. The first we have already stated was dedicated to Professor Leybourn "as a token of grateful recollection of thirty years' correspondence," but the second portion was "most respectfully inscribed to Robert Adrain, LL.D., Professor of Mathematics and Natural Philosophy in Columbia College, New York, as a public expression of esteem for his worth and talents." In the advertisement prefixed to the work Mr. Swale observes that it has frequently been a "matter of surprise and regret, that Liverpool, rapidly approximating in commercial enterprise, in opulence, in architectural splendour, and in general intelligence to the British metropolis, should yet have contributed so little to the encouragement of mathematical science through the medium of her public press." He further remarks, that although "a rising community eagerly employed in extending its commerce and accumulating wealth, and at the same time *generally ardent* in cultivating and patronising mathematical science, is a phenomenon, merely utopian, not to be realised in the history of man." Yet presuming that "the destinies of man invite him to *higher* enjoyment than that to be derived from the gratification of mere *external* sense, and that the varied and vigorous exercise of the intellectual powers in the wide and fertile field of science, affords a perennial source of *one* of the purest and most exalted pleasures of which our nature is susceptible;" he "presents to junior geometricians in general, to those of Liverpool in particular, and to all promoters of the pursuits of intellect, the first number of the *Apollonius*." Its pages include a memoir of Apollonius, from Montucla; the origin and progress of geometry, from Bossut; the stability of ships, from Vince; On Newton's system of philosophy, from Maclaurin; the doctrine of mathematical axioms, from Stewart; an essay on the utility of mathematical learning, from Passman; together with various original papers by Messrs. Dickenson, Adrain, Whitley, Samuel Jones, and Bartholomew Prescot. The last named gentleman undertook

in a series of seven letters, to prove the *falsity* of the Newtonian system of astronomy, and by consequence the *truth* of his own; but his ill-judged and intemperate attack would seem to have failed in producing the desired effect, for the Newtonian theory of gravitation is still the orthodox faith, whilst that proposed by Mr. Prescot, although founded on his own explanations of holy Writ, and supported by appeals to common sense, has long since been deservedly forgotten. Of Mr. Swale's geometrical papers in the *Apollonius* it is scarcely possible to speak too highly. The first contains "some properties of tangential circles, briefly demonstrated, with their application" to twelve leading problems on the circle, and no fewer than forty-one deductions, including the now celebrated case of describing "a fourth circle to touch three others anyhow given in position." His next paper on "geometrical maxima and minima," which is followed by "improved or generalised solutions" to problems which had been elsewhere discussed, and a series of "diversified solutions to the same problem." A considerable number of beautiful properties relating to Halley's Diagram occur in these investigations, as well as several of the leading cases of lineal section. The labors of Simson, Landen, Burrow, and others, are reviewed as he proceeds, whilst in problem 3 we are presented with no fewer than *nine* original methods of drawing a tangent from a given point to a given circle. In the paper on "the inscription of polygons in a circle when each side of the inscribed figure passes through a given point," he reduces the whole, when the number of the sides is *odd*, to the "elementary problem of *drawing from a given point, a tangent to a circle given in position and magnitude;*" and when the sides are *even*, the construction of the general problem is reduced to the equally simple matter of "*drawing from a given point a line parallel to a right line given in position.*" The "inscription of polygons in given polygons," under the same conditions, is reduced in like manner to the utmost degree of simplicity, the final result being that nothing more is required than the description of a "*circle through three given points.*" Had the *Apollonius* been continued the next number would have been a most valuable acquisition to the geometrical student. The new lists contain forty-five carefully selected questions in various departments of mathematics, the geometrical element, of course, preponderating. Many of these are proposed by himself under various signatures, and their solutions would have afforded ample scope for the exercise of his versatile genius; but "continued indisposition, which suspends all intellectual pur-

suits," combined with the unprofitable sale of the portions already issued, rendered it utterly impossible for him to continue the publication.

The duties of a large academy added to the wear and tear of a youth spent in the laborious avocation of tuition, at length produced their usual effects upon Mr. Swale's constitution. Symptoms of decay had begun to manifest themselves some time before the publication of his first work; but they were generally of such a nature as not to excite any serious apprehensions. The attacks of an insidious disease, however, gradually became more severe, and although naturally robust and strongly built, his nervous system ultimately became so much shattered by continued application that he was compelled to give up his establishment at the close of 1823. "Brunswick Place Academy" was still in a very flourishing condition when this unfortunate circumstance occurred. For many years it had been well supported by the public, and consequently possessed a high mercantile value; but he had conscientious scruples respecting the *propriety* of scholastic transfers, and hence "some of his peculiar notions prevented him from disposing of his school," which he might then have done to considerable advantage. On the partial recovery of his health he occasionally undertook to instruct a few private pupils in mathematics, and might have become fully occupied with such engagements, but he declined to extend his connections, and contented himself with "spinning his cobwebs" as he facetiously termed his speculations in pure geometry. Probably his recovery would have been much more rapid had he not in an unguarded moment advanced a considerable sum without security to a near relation who subsequently defrauded him of the whole amount. The effect of this untoward occurrence upon his general health may easily be conceived; and his manuscripts contain several memoranda indicative of his strong feelings on the subject when casual circumstances led him to revert to the improper conduct of his "dishonest relative."

Notwithstanding a continued tendency to depression of spirits, his active mind never appears to have relaxed its efforts in any considerable degree. With him "Divine Geometry" was ever in the ascendant, and his favourite study would seem to have furnished a never-failing source of pleasure. What to most persons proves to be really a severe mental discipline was considered by Mr. Swale in the light of recreation, for he endorses one of his latest manuscripts as "*Geometrical Amusements* [intended] to soothe

an incurable despondency." During the later years of his life he occasionally exchanged the bustling activity of the town by making short excursions into different parts of the country, his principal objects being change of air and the enjoyment of rural scenery. It was whilst thus engaged that he availed himself of opportunities to renew the personal acquaintance of many of his old associates, amongst whom the names of Shepherd and Whitley most frequently occur in the memoranda relating to these exhilarating rambles. Recreation and his favourite studies continued alternately to occupy his attention until his earthly career was terminated, by a short and severe attack of influenza, on January 13th, 1837, in the sixty-second year of his age; and his remains lie interred in the Necropolis, a picturesque burial ground in the immediate vicinity of Liverpool.

The activity of mind displayed by Mr. Swale, throughout the whole of his mathematical career, could not but be productive of great results, and hence we find that, independently of his published writings, he has collected no fewer than eighteen manuscript volumes of literary and mathematical disquisitions. Several of these have evidently been formed from others of earlier date, since they contain a series of diagrams, and a few choice investigations which had previously appeared in different periodicals, but by far the greatest portion have resulted from his practise of "spinning geometrical cobwebs," as an amusement during the leisure hours of declining age. Each of the volumes contains a title in some degree indicative of the contents—but the utmost latitude of meaning must be allowed in this respect, for nothing more than a very general description could be attempted to a collection of solutions to several thousand geometrical, algebraical, and other questions, arranged without much regard to difficulty, order, or subject. The following enumeration, however, may serve to show that had their author met with sufficient encouragement we should have had no lack of matter for a lengthened series of the *Liverpool Appollonius*.

I.—Geometrical Disquisitions, Christmas, 1811.
II.—Geometrical Amusements, Christmas, 1818.
III.—Geometrical Amusements, Midsummer, 1819.
IV.—Geometrical Amusements, Christmas, 1819.
V.—Geometrical Sketches, { Midsummer, 1823. / Christmas, 1823. / Christmas, 1824. }

VI.—Geometrical Papers.

VII.—Memoir of the late Reuben Burrow.

VIII.—Miscellaneous Collection of Geometrical Questions; those not *original* being proposed for the purpose of *generalising* and receiving *improved* and *original* solutions.

IX.—Miscellaneous Collection of Geometrical Questions.

X.—Original Theorems on the Circle, with their use in the determination of some Geometrical Problems.

XI.—Geometry and Algebra.

XII.—Mathematical Scraps.

XIII.—Memorandums, Scraps, Mathematical, Poetical, Biographical, and Satirical.

XIV.—Memorandums, Scraps, Mathematical, &c., &c.

XV.—Geometry of the Circle, vol. 1.

XVI.—Geometry of the Circle, vol. 2.

XVII.—Diversified Solutions to the same Problem.

XVIII.—Geometrical and Algebraical Amusements.

We have not yet had the opportunity of examining the first six of the manuscripts in the preceding list. Their contents are therefore matter for conjecture; but from the titles affixed to the second, third, and fourth, we may reasonably infer that they were intended to form a portion of the *Geometrical Amusements*. The memoir of Reuben Burrow was originally written for the biographical department of the *Mathematical Repository*, from documents furnished by the late Professor Leybourn. It gives a very clear and satisfactory account of the principal events in the life of this able, though somewhat eccentric mathematician, but owing to the discontinuance of the *Repository*, this sketch remained in manuscript until published, with the present Mr. Swale's consent, in a recent volume of the *Mechanics' Magazine*.

Volume ix. is a continuation of volume viii., and they contain, in the whole, about 425 quarto pages of densely crowded matter. In addition to numerous original theorems and problems, these volumes contain diversified constructions, with occasional analyses and demonstrations, to all the principal geometrical questions which had been proposed in most of our mathematical periodicals and several other works, illustrated by upwards of one thousand carefully constructed diagrams. Each day's work is generally pointed out by having its respective date affixed, and many incidental

notices occur at intervals, which prove that he sustained a long and active correspondence with several of his old associates. Pages 197-198 are occupied with the demonstrations of several theorems, which he afterwards applies to the determination of the general problem on inclinations; and this subject is again resumed in pp. 233-235, where two or three different constructions are given to each particular case, but, agreeably to Mr. Swale's usual practice, no demonstrations are added. This omission is the more to be regretted since the methods employed are generally different from those to be found in the works of those authors who have treated on these portions of the ancient geometry. The maxima and minima of geometrical quantities occupy pp. 251-257—a "collection of problems by the compasses alone" are contained in pp. 292-332—and the leading problems on the Tangencies are elegantly constructed in pp. 383-386.

The latter portion of volume x. is fully prepared for the press. Five theorems are distinctly enunciated, demonstrated, and applied to the solution of *ten* collateral problems, most of which have since been published as questions, 549-582, in the *Educational Times*.

At the commencement of volume xi. we find a few instances of geometrical loci, which are followed by an analysis and construction of the general problem of inclinations in pp. 2, 89, 91, and 93. Pages 101-132 contain a connected series of forty-two geometrical exercises originally compiled as "lessons for his son;" and amongst the remaining contents are interspersed solutions of some difficult diophantine problems, one of which is a prize question from the *Repository*, where the gold medal is awarded to Mrs. Somerville for her elegant solution. Volume xii. commences with various methods of drawing tangents to a given circle, so as to be divided by a line given in position and the point of contact, into parts having a given ratio. Pages 20 and 21 contain no fewer than *eight* different methods of drawing "through a given point P, a line that shall tend to the point of concourse of two other lines, AB and CD given in position." Some problems on the maxima and their application occupy pages 32-45, and the concluding portion of the manuscript contains ingenious solutions to some of the most difficult equations in Dr. Bland's *Algebraical Problems*. The title of volume xiii. almost sufficiently explains itself, and but a slight inspection is necessary to prove that its designation is not unaptly chosen. A letter to a friend occurs at page 42, in which he desires him "to recollect that

Euclid existed nearly three hundred years before Christ, and that [he is] yet nearly a stranger to those *Elements* which have conferred imperishable renown on their author and compiler." Mr. Swale was ever anxious that the ancient geometry should be in the ascendant, and to this end he never omitted an opportunity of impressing the beauties of his "Divine Geometry" upon the minds of his junior correspondents. A few statical and dynamical problems are inserted in this volume, but they present no difficulties worthy of particular notice. The most important enquiry, perhaps, is that which determines the direction of impulsion of a billiard ball on a triangular table, "so that it may *for ever* pursue the same track," to be the sides of the *triangle of minimum perimeter* inscribed in the given triangle.

Volume xiv. is a bulky octavo, bearing the same title as the preceding. It opens with a series of "Lessons for his Son," amongst which are no fewer than *fourteen* original methods of dividing a given line in extreme and mean ratio. Several of the isolated solutions to other questions contain references to the *Geometrical Amusements*, and were probably intended for the succeeding portions of that valuable work. The most important portion of the volume, however, is a short discussion of the different cases of the problem, "to determine P in a line MN of any order, so that drawing the tangents PV, PT, to two given circles, (A) and (B), they shall have a given ratio."

The writer of this notice has recently considered the same subject, in connection with circles of similitude, and our united labours form the subject of a paper printed in the appendix to the *Lady's and Gentleman's Diary* for 1855.

The *fifteenth* and *sixteenth* volumes are devoted to the consideration of the Mascheronian geometry, or that which is limited to the use of the ruler or the compass alone. He commences with the division and subdivision of lines, the division of arcs of circles, drawing tangents, and finding proportionals. He then proceeds to the description of polygons; their inscription in circles, and in each other—to many of which problems four or five different constructions are given. The latter volume is, however, by far the most curious and valuable. He commences by describing a tangential circle to touch two or more given circles, and after having given various constructions to these he proceeds to the construction

of the different cases of the Apollonian problem of tangencies, with the exception of that where a tangent circle to three given circles is required to be described; the *enunciation* of the problem being all that appears in the manuscript. The remainder of the volume is occupied with the construction of numerous other problems relating to the intersection of circles or tangents to them drawn from given points and having given ratios, many of which are remarkably curious and interesting. His objects throughout appear to have been to extend and diversify Mascheroni's methods, and in these respects he has succeeded to a greater extent than it is possible for any verbal statement to describe.

Volume xvii. is a short paper fully written out for the printer. It contains *four* different constructions and demonstrations to the problem of having "a point P, and two parallel lines AQ, BR, given in position, to determine the position of a line PQR, of section, making the rectangle, sum of squares, or difference of squares, of the segments AQ, BR, cut off from the lines given in position, equal to a given square; and was intended for insertion in the third number of the *Apollonius*.

The *eighteenth* volume is divided into two parts, the first of which is devoted to the solution of diophantine and other algebraical enquiries; and the second to the consideration of numerous original and selected geometrical problems. Pages 298-308 contain a discussion of the problem "to determine a point P in AC, the side of a given triangle ACB, such that drawing PQ perpendicular, and PR parallel to the base AB, the ratio, sum, difference, rectangle, sum of squares, or difference of squares, of PQ and PR, may be respectively equal to given quantities;" *four* different constructions and demonstrations being given to each case. The problem partially considered in volume xvii. is extended to the cases of the ratio, sum, or difference of AQ and BR, in pages 308-316; and several other problems are treated in a similar manner, each successive variation unfolding new properties of the illustrative diagrams, and affording additional proofs of Mr. Swale's extensive powers in geometrical research. A case of Apollonius on inclinations closes this volume, which, from *internal* evidence, appears to contain the latest efforts of his untiring mind.

In consequence of the absence of so many of the requisite demonstrations, an immense mass of Mr. Swale's speculations must ever remain in an incomplete and unprofitable condition. The state of geometrical

science has undergone a radical change since the time he wrote, and hence, few will hereafter be found either able or willing to supply such demonstrations as will render the theorems and problems intelligible to the student. It is also much to be regretted that he spent so much time on merely isolated problems, which have, at best, but little beyond their difficulty to recommend themselves to notice. As we have elsewhere observed, "his systematic researches on tangencies, maxima and minima, the inscription of polygons in circles and in each other, printed in his Apollonius, afford convincing proofs of how much he was capable of, when his powers were directed to regular subjects of enquiry; for the elegant methods of research employed in these papers, and the simplicity and beauty of the results obtained must ever command the admiration of geometers. His fertility of invention, and originality of conception, were inferior to those of no contemporary geometer, and had he directed those energies to systematic enquiries which he expended on the solution of some thousands of isolated and comparatively uninteresting questions, he might have systematized scattered topics or originated new theories in which he would have rivalled Carnot in transversals, Davies in spherics and porisms, or Chasles in anharmonic ratio, and have thus secured for his own name a permanent place in the history of modern geometry.

What will ultimately become of these manuscripts is, of course, beyond conjecture. That they will be almost religiously preserved by his son during his life no one will doubt who is acquainted with the profound veneration he entertains for the memory of his father;—but when we call to mind that a *second* generation has deliberately *burnt* the papers left by the Stewarts, and that already much of Mr. Swale's correspondence has been destroyed by an accidental fire, it may not be improper to suggest that these manuscripts ought to be deposited in some public library, where they would at once be safe and accessible, and like Dr. Simson's *Adversaria*, at Glasgow, ever remain an enduring monument of the genius and industry of so devoted a geometer."

Remarks upon the Flora of Liverpool.

By H. S. Fisher.

(Read 24th May, 1855.)

The Flora of this district is continually presenting new aspects. Dock extensions and vast building operations destroy old and well known localities for plants; while our railways forming fresh sites, and disinterring buried seeds, add new varieties to our Flora. Another source of supply, equally fruitful, may be from the introduction of foreign or other seeds from a distance with our merchandise. Of these facts we have many instances. Some of our local botanists can recollect the time when specimens could be gathered on the site of some of the docks, now entirely surrounded with densely populous streets; while within the space of a few years, plants might have been gathered on the shore where now is formed our many miles of northern docks. Of those plants so lost we may mention the Convolvulus Soldanella, the sea-side convolvulus, formerly found abundantly near the Bootle land marks, but now entirely eradicated; and the still more rare Asparagus officinalis, the common asparagus, found in the same place, but now also totally lost. The plants of this district have received many interesting additions since the publication of our Liverpool Flora; of those plants I shall now give a list, with a few observations on the most inferesting of them.

Helianthemum guttatum. This plant, although common in many parts of Lancashire, was not found in this locality until last year, when a small patch of it was found by Mr. Thomas Williams, on the sand hills below Halsall.

Viola lutea.* The yellow violet or pansy, I am told, many years ago used to be found in this neighbourhood; and it is stated by Mr. Grazebrook in his Guide to Southport, to occur in that locality, but there are no specimens to substantiate his statement. The year before last I had it brought to me from Allerton, where, in a cultivated field it was growing in great abundance and luxuriance. The flowers vary from all yellow to dark purple and yellow.

* Dr. Dickinson gives it as his opinion that even in this new locality the plants have escaped from some garden.

Viola odorata, variety alba. The white sweet-scented violet grows abundantly in the grounds of a gentleman's house at Aintree. This is the only genuine wild locality we have for this general favourite; for although it is found in several situations, yet it is I believe, without exception planted.

Silene hirsuta. A hairy variety of S. inflata. This very pretty plant was found on the roadside between Bebbington and Parkgate. Some of the specimens were very luxuriant, two or three feet in height. I am not aware that this is the general appearance of the plant, if so, it would seem to point it out as a separate species, as this, combined with the hirsute margin of the leaves, gives it a very distinct appearance.

Stellaria glauca. This is in Mr. Aughton's list of Southport plants, but the locality was considered doubtful. Mr. Thomas Williams found it plentiful in ditches on Martin Mere.

Cerastium atrovirens, of Babington's manual, a variety of Cerastium tetrandrum, though the difference is very trifling, and seems principally to consist in the bract of atrovirens having a very narrow membranous margin, while that of tetrandrum is broadly membranous. It is found on New Brighton sand hills. J. Shillitoe.

Erodium maritimum. Sparingly on a sandy hillock between Birkdale and Southport. T. Williams.

Polygala oxyptera is worthy of notice, for although only ranking as a variety, yet from its mode of growth and general appearance, it is easily distinguished from Polygala vulgaris, from which it differs in having smaller flowers, and the fruit broader than the wings of the calyx. The flowers vary in colour from pure white to a deep blue. On the sand hills at Waterloo it is abundant, but I have not observed it in any other locality along the coast.

Lathyrus Aphaca, the yellow vetchling. Of this rare species I found one specimen in 1852, on Seaforth Common near the Rimrose Bridge, but although I have searched diligently for it each season since, I have been unable to find it again. As this is a likely locality for it, it may in the course of time be re-discovered.

The want of a thorough examination of the plants of this neighbourhood I think, is fully proved by the fact that among the Rubi alone, I was enabled last season to add to our Flora no fewer than nine species. It is true, that

from the difficulty of distinguishing the varieties, and also the uncertainty of any information on the subject, many will have felt a reluctance to commence the study of them, yet I cannot but be surprised that Liverpool should have remained so long without some information on the matter. The number of species in the Flora is only five, while the Manchester Flora can boast of no fewer than twenty-four. I may also remark that there is considerable difference of opinion as to which should rank as mere varieties and which as distinct species. Many think that we are indebted to the bees for many of our species, by their inoculating one plant by means of the pollen from another adhering to their bodies. I will give the localities for the new ones, and submit for your inspection specimens of them.

Rubus leucostachys. Hedges at Walton. Plentiful.
R—carpinifolius. Hedges, Everton.
R—rudis. Hedges, Walton Lane.
R—Koehleri. Hedges, Sleeper's Hill, Everton.
R—cordifolius. Hedges, Walton.
R—plicatus. Bank at Seven Pits on the Aintree Road.
R—nemorosus. Hedges, Walton.
R—affinis. Hedges, Priory Lane, Walton. Abundant.
R—Sprengelii. Hedges, Sleeper's Hill, Everton.
R—suberectus. Bath Wood, Ormskirk.

This last found by Mr. Thomas Williams.

Rosa villosa. This species of rose I have found in two or three different localities, and the wonder to me is, how it could ever have been overlooked. In hedges at Bebbington, Kirkby, Bootle, and Walton, this plant may be found, and especially at the last, where it ornaments the hedges with its handsome deep red flowers, which, with the strong resinous smell of the leaves is sufficient to distinguish it from the varieties of R. canina.

Rosa Forsteri. By some considered a variety of R. canina, while others rank it as a distinct species. In one place in the hedges of some fields at Walton it may be noticed.

Rosa rubiginosa, the eglantine or sweet briar. This interesting and beautiful flower I found plentiful in a hedge at Bebbington. Its aromatic perfume, with its elegant but small leaflets, at once determines the species. I cannot but regard this as a very pleasing addition to our Flora. It is a

plant familiar to all, though seldom met with in a wild state, and the "dew decked eglantine" often forms the subject of the poet's song.

Epilobium tetragonum, near Thornton. Probably common about Liverpool, but overlooked as Epilobium parviflorum. J. Shillitoe.

Callitriche sessilis, of Babington, a variety of pedunculata, I have found frequently in pits at various localities. I believe this will turn out to be Callitriche autumnalis of our Flora, which is stated to be common, especially in Wirral. I have never yet been able to find a single locality for C. autumnalis, while C. sessilis is very frequent. All the Liverpool botanists to whom I have shown my specimens have named it C. autumnalis, from which however it is quite distinct. The fruit when examined under the microscope, in C. sessilis has the leaves parallel in pairs and *obtusely* keeled on the back, while in C. autumnalis the leaves diverge in a stellate manner, and are broadly and *acutely* winged at the back, and the fruit altogether is four times the size of that of sessilis. The floating spatulate leaves are often wanting in C. sessilis, making it still more liable to be mistaken for C. autumnalis, the immerged leaves being the same as in that species.

Myriophyllum alternifolium. Pit by the roadside between Bebbington and Parkgate. J. Shillitoe.

Ribes alpina. Indigenous near Burscough Priory. T. Williams.

Ribes nigrum. Also truly wild near Ormskirk.

Anthemis arvensis. Hedges at Thornton Hough. J. Shillitoe.

Crepis paludosa. Ditch near Parkgate. J. Shillitoe.

Myrrhus odorata. Barrenbrook Delf, Bickerstaffe, near Parkgate Farm; also roadside between Croxteth and Simonswood. In this last locality it is an outcast from some garden.

Pyrola maritima. This plant is a variety of P. rotundifolia. It is found on sand hills at Crosby and Southport. The only British locality I believe for it with the exception of Yorkshire. The station for it is given in our Flora under the name of P. rotundifolia, from which however it was discovered to be distinct by Mr. Kenyon. (See Babington's Manual, 2nd edition.) It was lately discovered by William Skelhorn and Mr. Thomas Williams. It differs from P. rotundifolia by being in all its parts much smaller, the leaves being about half the size, and the petioles proportionately

shorter. But by far the best mark of distinction may be found in the numerous bracts situated on the stem in this variety, numbering from three to eight, while in the normal type P. rotundifolia, they rarely exceed two.

Cuscuta Europea. Bidston Hill. J. Shillitoe.

Myosotis sylvatica. Wood, near Croxteth Hall. J. Shillitoe.

Centunculus minimus, the Bastard Pimpernel. This, the smallest of our British flowering plants, was discovered by Messrs. Shillitoe and Skelhorn, on the Sand Hills at Ainsdale. It is, when growing, a perfect little miniature plant, and one seldom met with, as from its small size, it is very easily overlooked.

I was led last year by some observations of Mr. Babington, in the Phytologist, to examine the Armerias found in this neighbourhood, in order to determine the varieties to which they belonged. With the assistance of my friend, Mr. Baker, of Thirsk, the following were made out:—

Armeria maritima, scotica, and pubescens, all from Bromborough Pool. The last, pubescens, is the most rare, and easily distinguished from its being of a more luxuriant growth, flowers of a darker colour, and remaining in bloom longer than either of the other varieties growing with it.

Primula elatior, the oxlip. A rare and interesting plant, occurs sparingly about Ormskirk, near Burscough Priory. T. Williams.

Plantago media. Front of Knowsley Hall. Very likely to have been introduced with grass sown in this locality. J. Shillitoe.

Empetrum nigrum. Plentiful on the Fir Rough, Ormskirk. T. Williams.

Salix decipiens. Plentiful in hedges below Halsall.

Ophrys apifera, the bee orchis. This very pleasing and rare plant was found by Mr. Wilson, of Warrington, in company with Mr. Harrison, on the Crosby Sand Hills. I am afraid we shall have to consider this as introduced, it being a plant seldom occurring, except on a chalky soil.

Listera Nidus-avis, the bird's nest. This plant is given in the Flora as being found at Hale, by John Harrison, of St. Helens, but requires confirmation. Mr. Williams gives as an authentic locality, Latham House Woods, near Ormskirk.

Eleocharis uniglumis. This rare species I had the pleasure of finding at Seven Pits, on the Aintree road. It is very difficult to distinguish from

E. palustris; the small size of the plants growing in the above locality, not being the usual form of this species, although I have specimens from Yorkshire very similar in every respect. The difficulty of distinguishing this species, led me to send Mr. Babington fresh specimens on two occasions. After a very careful examination, he gave as his opinion that it was the species I supposed. This is the first time this plant has been discovered in this division of the country, as Great Britain is divided into sections by Mr. Watson, in his Cybele Britanica.

Eleocharis multicaulis. Very sparingly on a salt marsh, between Halsall and Southport, growing with Pyrola maritima. T. Williams.

Potamogeton lucens. Pit at Formby. J. Shillitoe.

Carex lævigata. This comparatively rare species was found by James Shillitoe, in a Wood, in Knowsley Park.

Avena flavescens. Bidston Marsh. J. Skelhorn.

Triticum loliaceum. This very pretty little grass was discovered by Mr. Shillitoe on some waste lands, near the shore, at Parkgate; it was growing plentifully, but the land last summer was cut up for building purposes, so that it is now lost. Any of our Lancashire friends, who may be interested in it, can obtain a specimen from the collector.

Poa subcærulea. Walls, near Kirkdale Gaol, and on New Brighton Sand Hills. This is merely a variety of P. pratensis, *perhaps* caused by situation.

I shall now proceed to enumerate a few plants supposed to have been accidentally introduced into this neighbourhood, believing that any observations respecting the time and manner of introduction must ultimately prove of value and interest to the botanist, for it is a well-known fact, that we are, year after year, adding fresh species to the British Flora, many of them undoubtedly exotic, while the manner of introduction remains a mere matter of speculation, some of them in the course of time becoming so thoroughly naturalised, as to make many doubtful as to whether the plants are truly indigenous or not. Thus, some of the plants that once decked the simple gardens of our ancestors, or the medicinal gardens of the Convents and Monasteries of England, are now so apparently wild as to mislead the botanist, and puzzle him where to draw the line of limitation, between the alien and the native species.

Coronilla varia. A plant with very slight claims to being British, and justly excluded from many of our Floras; was found by William Skelhorn, near Upton, in Cheshire. The flowers are very handsome and showy, and if this plant should ever be thoroughly naturalised, it will form a very elegant addition to our British plants.

Trifolium resupinatum. A very pretty small clover, distinct from all the other species by its resupinate flowers, each flower being reversed in position, the open part of the corolla being upwards instead of downwards, as in all the other clovers. The flowers are of a beautiful crimson, small but elegantly shaped, the heads when in seed are nearest allied to T. fragiferum, the strawberry-headed trefoil, named from the resemblance of the seed vessels to that fruit. The first specimen found in this neighbourhood was in 1851, at Everton, near St. Domingo Pit. It has since been found growing plentifully at Fairfield, by James Shillitoe; and in the Phytologist, Mr. Baker named a locality for it at New Brighton, near the Magazines. In the Phytologist for last year, I suggested what I thought might be a likely means of introduction. We have, I am informed, a large quantity of foreign hay brought to this port, in compressed packages. This hay is often spread in the fields, for the purpose of feeding cattle. This, therefore, if my information be correct, must be the means of introduction of many foreign plants. I think this far more likely to have been the means of introducing this plant, than that generally supposed, that it was brought among ballast. This might hold good with respect to the New Brighton locality, but could scarcely seem reasonable for the other two. At Fairfield, this plant is abundant and very luxuriant, its pretty bright crimson flowers decking the ground in a very pleasing manner.

Euphorbia lathyrus. Fairfield. Most certainly an escape from some garden.

Cheiranthus Cheiri, the wall flower. On a very old wall at Gayton.

Serrafalcus patulus. A very beautiful grass, decidedly the most pleasing and interesting of our foreign introductions; was found last year, by James Shillitoe, growing on the edge of a clay pit at Rock Ferry. This grass has only once before been discovered in Great Britain, which was at Hebden Bridge, Yorkshire, where it had been introduced among wool. Mr. Shillitoe informs me that the specimen from Rock Ferry has every appearance of being indigenous. However this may be, it can scarcely be a

native grass, although its vicinity is worthy of close examination as likely to lead to some interesting information respecting the time and manner of its introduction.

The list of mosses, as given in the Liverpool Flora, is very imperfect, arising in great measure from the fact that it was principally prepared by two botanists who had then only for a year or two been engaged in the study of this interesting class. Since its publication, there has been a large number of species added to it, some of them the rarest mosses we have, so that now there is an addition of at least half as many as the original list boasted. For these we are, in great measure, indebted to the indefatigable zeal of one of our local botanists, Mr. F. P. Marrat, who has himself been instrumental in searching out and naming some of the most obscure of our mosses.

Perhaps there has been no place more fruitful in the production of mosses than the sand hills of the Mersey. From Waterloo to Southport we have a succession of interesting species, many of them confined to the sea side, and well remunerating the muscologist for the trouble of collecting.

It is not my intention to occupy your time by any lengthy observations on the species or localities, but I may perhaps be permitted to make a few remarks on one or two of the mosses found on the sand hills.

Hypnum nodiflorum. A moss that appears in this locality to have been overlooked for years as a variety of H. stellatum, was first discovered to be distinct by Mr. Harrison of the Botanic Gardens. It is easily distinguished from H. stellatum, under the microscope, by the nerved leaf, that of H. stellatum being nerveless.

Hypnum elodes and lycopodioides, two rare mosses, have also been found growing plentifully on the sand hills—the former at Southport, and the latter at Crosby.

Among the Brya many interesting additions have been made from the same locality. Bryum Marratii was first found, by Mr. Marrat, on the flat sands at Southport, and was named after him by Wilson and Hooker. At first it was mistaken for a variety of B. calophyllum, but the true B. calophyllum or latifolium being found in company with it, led to a close examination of the supposed variety, and essential marks of distinction were discovered; the chief difference being in the form of the

capsule—that of Marratii being nearly round and much smaller than in B. calophyllum, there is also a marked difference in the leaves. I may remark that B. calophyllum is by far the more rare of the two, being found in this one locality in very small quantities.

Bryum Warnerii, intermedium, rostratum, and turbinatum, have also been found at Southport.

Among the inland mosses there have also been many valuable additions to the Flora. Hypnum, trichomanes, striatum, pratense, loreum, sericeum, pumillum, aduncum, uncinatum, and revolvens, with others of less moment, have been added to the list.

Campylopus torfaceus, Didymodon heteromallum, Catoscopium nigritum, and Phascum serratum, with others too numerous to mention, all tend to make our list of species as interesting as that of the most favourite muscological districts.

On the Illumination of the Diatomaceæ, when viewed under the Microscope.

By Thomas Sansom, A.L.S., F.B.S.E., &c.

(Read 24th May, 1855.)

In bringing before the Society the subject of the illumination, under the microscope, of lined objects, or, in other words, the Diatomaceæ, by means of oblique light, I shall not enter into the theory of optics, but confine my remarks to a few practical suggestions on the best mode of obtaining a simple and efficient illumination when high powers are used.

Within the last few years, and especially since the establishment of the Microscopical Society of London, in 1840, the energies of several of the most talented opticians, both there and elsewhere, have been devoted almost exclusively to the improvement of the microscope; and that instrument is now so complete, mechanically and optically, that the microscopes of the three principal makers have obtained, as they are entitled to, universal celebrity.

The greatest of all the modern improvements, is, perhaps, the large increase made to the angle of aperture of the more recent object glasses,

and the three principal makers, viz., Mr. Andrew Ross, Messrs. Smith and Beck, and Messrs. Powell and Leyland, have produced most extraordinary glasses in this respect. The Jurors, in their report on the Great Exhibition of 1851, speaking of the glasses of Messrs. Smith and Beck, say "they are beautifully corrected for spherical aberration, but the secondary speculum has not been much diminished. The half inch focus of 70° aperture [now called four tenths] is a wonderfully fine combination, easily showing objects, considered difficult for a $\frac{1}{8}$ inch focal length a little more than a year since, and bearing the application of the higher eye pieces in an unprecedented manner."

Since the report was written, of which the above is an extract, other and still greater improvements have been made, and we have now $\frac{1}{4}$ inch object glasses of 85° of angular aperture,* $\frac{1}{8}$ of 150°, and $\frac{1}{16}$ of 170°.

Having thus attained such comparative perfection in our object glasses, it became necessary to improve the means of illumination, hence innumerable achromatic condensers have been invented, until we have now one for almost every class of objects in our cabinets. Many of these instruments are most elaborate and elegant as works of art, but they are costly, and are therefore very popular amongst a class of microscopists who use their instruments only to observe such characters as are already pointed out, and to be found on slides, sold mounted ready for exhibition.

In viewing the Diatomaceæ under the microscope, it is found from experience, that in order to see the markings on the more delicate shells, glasses of large angular aperture are required, and that the shell should be illuminated with oblique light. The question then for consideration is, what is the best mode of applying that light?

The principle involved in the construction of almost all the modern achromatic condensers is that of stopping out the central rays of light, and illuminating the object by the external rays only. This is usually accomplished by a revolving diaphragm, placed below the bottom lens of the combination, or introduced between the glasses. It is supposed by this means that shadows are avoided, and the definition of the object is improved. Now this must be admitted in theory to be correct, but I think it very doubtful whether in practice such perfection is often attained.

* I am now informed (July, 1855) that Mr. Ross has succeeded in producing $\frac{1}{4}$ inch object glasses, of 95° and 130° of angular aperture.

If you use an object glass, say a quarter of 240 linear magnifying power, and 72° of angular aperture, and from which the central rays have been stopped, under the stage as an achromatic condenser, and take for an object glass a low power, say ½ of an inch focus, you will, on centering the condenser carefully, obtain a small cone of light, of about 20-1000th of an inch in diameter, in the centre of the field of view; then place on the stage of the microscope a micrometer, in lieu of an object, which, when properly focussed, will be viewed with light reflected directly through the microscope. Now if the mirror be kept in the same axis, as originally adjusted, but slightly elevated either on the right or on the left, the cone of light by which the object *would* be illuminated, will travel over a distance of 40-1000th of an inch on the micrometer, thus showing the extreme difficulty in adjusting a stopped condenser, for the higher powers, in such a way that *all* the external rays shall converge to a true centre. The whole field of view of Ross's ½ object glass, with the lowest eyepiece is 12-1000th of an inch, whereas a very slight movement of the mirror will alter the position of the cone of light reflected through the condenser, and shown on the micrometer to the extent of 40-1000th of an inch, or more than three times the diameter of the whole field of view.

Under these circumstances, I conclude the advantages resulting from the use of stopped condensers is more ideal than real, and that most frequently when the objects are shown very successfully by means of these condensers, the illumination has been effected by unintentionally shutting off the rays of light from one side of the condenser, as well as from the centre. However, under any circumstances, I feel satisfied that the most important discoveries have been made by the application of oblique light, applied directly upon the object by means of the bull's eye, or the condenser recommended by Mr. Sollitt, (vol. iii. page 87 Journal of Microscopical Science). This condenser consists of two achromatic lenses, one of four, and the other of two inch focus. The four inch lens has an aperture of 1¼ inch, and the two inch lens an aperture of ¾ of an inch; they are placed at 1¾ inches asunder, and the compound focus is an inch beyond the smaller lens.

The readiest mode of using oblique light is to place the lamp directly opposite to the stage of the microscope, then apply an ordinary bull's eye, or the combination of lenses invented by Mr. Sollitt. By depressing or

elevating the body of the microscope, you may throw a flood of light on the object, at a greater or less angle, according to the power of the object glass. If the objective be of small angular aperture, and the light be applied at a greater angle than is suitable to the glass, the field will appear dark, and nothing will be visible; but should the objective be of large angular aperture, and of high magnifying power, the markings on the most difficult test objects will be clearly defined. Much of the success of the operation will depend on the position of the shell. In some cases, and especially in those where the markings are very delicate, it will frequently be necessary to revolve the slide; this may be done where the stage of the microscope has a circular motion, which is usual in the better class of instruments, but where that is not the case the same object may be attained by altering the position of the condenser, according as circumstances may dictate.

The best way to judge of the merits of condensers, is to ascertain what success has attended their use, and if the principle be recognised as a test of quality, I think it may be fairly assumed that next to Sollitt's condenser, the bull's eye is the best; unquestionably nearly all the discoveries have been made by the aid of one or other of these instruments.

The Hull microscopists have, until within the last few months, used a small bull's eye, which costs 7s. 6d., and to them we are indebted for many of our greatest discoveries. Messrs. Harrison and Sollitt, in a paper read before the meeting of the British Association at Hull, in 1853, have given us a short history of the discoveries made by them, and as their investigations have, until lately, been carried on with the aid of the bull's eye, I take leave to quote their remarks. Speaking of the Diatomaceæ they say, "we in Hull first discovered the delicate markings on their silicious coverings, and pointed them out to others as the proper test for lenses. The first of the Diatomaceæ on which the lines were seen was the *Navicula Hippocampus* of Ehrenberg, Pritchard, and Queckett. This discovery was made early in 1841, when specimens were sent to the Microscopical Society in London, but the London microscopists not being able to bring out anything but the longitudinal markings, a remark was published by Mr. Harrison, in the Microscopical Journal for June, 1841, stating that we had discovered cross striæ on the *N. Hippocampus*, but that these were only visible on some of the specimens. On this they were immediately written to, and

told that we meant to say there were both longitudinal and cross striæ on the specimens sent. They, after labouring for nearly six months, and frequently asserting that we were mistaken, at length saw the cross striæ, and an account of our discovery then appeared in the Microscopical Journal for January, 1842. The next specimens on which the markings were seen by us were the *N. lineata*, of Harrison. This *Navicula* was unknown until 1843—at least it had not been described by any author before that time. In 1844 Mr. Sollitt was in London, and showed the lines on this Navicula to Mr. Ross, with a 1-8th of Nachet, although Mr. Ross, at that time, could not bring them out with a very fine 1-12th which he had just finished. This little circumstance, trifling as it may appear, caused that eminent optician to alter the construction of his microscope and to bring it into its present superior form. We afterwards discovered the lines on the *N. angulata*, *N. strigosa*, and after much labour those on *Ceratoneis fasciola*, and the *Navicula sigmoidea*, and afterwards on the *N. acus*, which last is so extremely difficult, that in order even to catch a glimpse of its delicate markings the observer must be in possession of glasses of a very large angle of aperture and the finest definition—have the most careful management of oblique light, and in addition be possessed of a large share of patience."

It will be observed that in the year 1841 Messrs. Ross and Sollitt held a discussion for nearly six months as to whether the *Navicula hippocampus* had transverse lines or not. These lines have since been measured and found to range about 42,000 to the inch, but Mr. Sollitt is now able to observe lines on the *Navicula acus*, estimated by him to measure 130,000 to the inch.

During a short residence in Hull last summer, I received many very valuable hints on the illumination by oblique light from Messrs. Harrison and Sollitt, and I have seen, under favourable circumstances, with the aid of the bull's eye, the lines on *Navicula acus* with the 1-8th of Ross of 152° of angular aperture.

By using oblique light as above described I find no difficulty in showing with a quarter-inch object glass of 85°, the markings on *Navicula angulata lineata*, *Spencerii*, *elongatum*, &c.; or with Ross's 1-8th of 152° those on *Ceratoneis fasciola*, *Navicula sigmoidea*, *Grammatophora*, *subtilissima*, and, indeed, almost every species of Diatomaceæ that I have examined.

On Liverpool Pottery.

By Joseph Mayer, F.S.A.

(Read 3rd May, 1855.)

In a work just published under the auspices of the Government, containing an account of the Specimens of Pottery in the Museum of Practical Geology in Jermyn Street, London,* I find that, under the head of Liverpool, the authors say, "no detailed information has hitherto been obtained at the Museum respecting this earthenware. It is known that potteries were carried on at Liverpool about the middle of the last century, and amongst them was one called the Herculaneum."

To fill up the chasm left by the authors in the history of the ceramic art in England, which, in reference to most other sites save Liverpool, has been detailed with as much accuracy as the materials in their possession would admit of, I am induced to give a few notices of Potters who carried on their works in Liverpool, when that art was in its infancy in England, and who, by their persevering industry and scientific knowledge, helped to raise up the fame of this now great national manufacture. For what the authors have done, every lover of the art must feel grateful to them, who have so perseveringly sought to fix the dates to the several inventions or improvements connected therewith, that their work is certainly the most complete of any yet published.

The early history of the art of pottery, as carried on in the town of Liverpool, is involved in much obscurity. The first mention of pottery in Liverpool which I have yet found, is in the list of town dues payable at the port in the year 1674, which contains the following items:—"For every cart-load of mugs (shipped) into foreign ports, 6d.; for every cartload of mugs along the coasts, 4d.; for every crate of cupps or pipes into foreign ports, 2d.; for every crate of cupps or pipes along the coast, 1d;" and from the specimens still remaining, I am inclined to assign to it a place amongst the first manufactories which were established in this country; nor am I aware that any authentic piece of English ware is known that can challenge

* Catalogue of Specimens illustrative of the Composition and Manufacture of British Pottery and Porcelain, from the occupation of Britain by the Romans to the present day, by Sir Henry de la Beche, C.B., and Thomas Reeks, Curator, London, 1855.

comparison, in respect of antiquity, with the large placque now before you. It was, I believe, made at the works of Alderman Shaw, situated at the bottom of Dale Street, and, as its inscription denotes, is "A West Prospect of Great Crosby, 1716." In the foreground are a number of ships and brigs, a sloop, and a schooner. The large ship has a boat fastened to her stern, and there is another boat with two men in it rowing towards her. On the water around them are numerous gulls and other aquatic birds; on the sands adjoining the water are various figures—women carrying baskets on their arms, and a man driving an ass before him. Rising up a little farther are the sandbanks, covered with broom and heather, amongst which are many rabbits, with the small house of the keeper of the warren. Further off, in the middle of the view, are men on horseback galloping, with cows, birds, &c., which occupy a large space, at the back of which are fields, surrounded and divided into larger and smaller plots by hedgerows, inside of which are numerous cattle, a milkmaid carrying a pail upon her head, and two men apparently conversing as they walk along. In the background is the town, including the school house and numerous other buildings, with long rows of trees and palings, gates, and other objects incidental to such a scene. On the right side of the view is Crosby

windmill, which is still standing. The appearance of the village, as viewed from the River Mersey at the present day, shows little alteration to have taken place in the locality during the 139 years which have elapsed since the prospect was taken. The slab is composed of a coarse brown clay body, smeared with a thick white glaze, on which the design is painted with a good rich blue colour. The surface is quite flat, and measures 2 feet 7 inches long by 1 foot 8 inches wide. It is nearly three-quarters of an inch thick. Another specimen exists in the old church at Crosby, affixed to the wall over one of the seats near the middle of the church; it is of a lozenge form, measuring 22 inches across its greatest length, 16 inches on each side, and nearly 1¼ inch thick. It is made of

the same rude body as the piece just described, and smeared with glaze; on it is also painted, in blue colour, the armorial bearings of the Merchant Tailors' Company of London, viz., argent, a tent royal between two Parliament robes, gules, lined ermine; on a chief azure, a Lion of England.

Crest, a Holy Lamb in glory proper. Supporters, two Camels or. Motto, Concordia parvæ res crescunt; below which is written in Roman letters, "This seat was erected by John Harrison and Henry Harrison, of Leverpoole, 1722." These gentlemen, I am told, were natives of Crosby, and erected and endowed the grammar school in that village, after having amassed large fortunes as merchants in the City of London; they left the trust in the hands of the Merchant Tailors' Company, who have lately restored the building.

There are several specimens of similar ware in my collection, which I have procured from families resident in the town long prior to that time; and that such was the style of manufacture, we have abundance of authorities for asserting; thus proving that manufacture to have been in active operation in Liverpool, and one of the earliest of the numerous potteries which sprung up in England at the commencement of the 18th century.* Amongst other notices, we may quote the following:†—"The chief manufactures carried on here are blue and white earthenware, which at present almost vie with china. Large quantities are exported for the colonies abroad." Amongst the specimens now exhibited are two "mugs," the body and glaze similar to the other specimens just named, but ornamented with flowers and leaves in blue, yellow, and green colours. The larger one, a quart mug, having on the side near the handle the letters and date, "T. F., 1757," was made at the pot works in Shaw's Brow, and presented to Thomas Fazackerly by a friend of his, a workman there. Mr. F. having married during the following year, his friend made the smaller mug, which holds a pint, ornamented in the same style and

* Since the above was in type I have found another specimen of Liverpool delf ware placed in the front of the house belonging to the farm occupied by Mr. Josiah Day, at Newton-cum-Larton, in the Parish of West Kirby, in Cheshire, being a very large circular plate having painted on it the arms of Johnson impaling those of Anton, and beneath them the date 1753. The Mr. Johnson here alluded to was Mayor of Liverpool in 1766, and to him we owe the formation of St. James' Walk. Having married an heiress, Miss Anton, he built the house above named, and here resided for several years, where the slab was placed, probably being the gift of his brother Alderman, Mr. Shaw, the Potter. *(See etching.)* When at the house a few days ago, Mr. Day presented me with several tiles, some of the old delf make, others of a more recent date, and one with the name "Sadler, Liverpool," upon it, which were formerly arranged round the fire-place; also a posset cup of the period of Shaw, also of the thick glaze style, together with a quart mug of coarse china body.

† The Liverpool Memorandum Book, or Gentleman's, Merchant's, and Tradesman's Daily Pocket Journal, for the year 1764, so contrived as to be useful and convenient for all sorts of people, particularly with regard to their expenses, engagements, and occasional business: printed for R. Williamson, &c.

colours, but the initials and date, are "C. F., 1758," being in an oval. This he gave to the new-married lady, Catherine Fazackerly, from whose son, now living at Newton-le-Willows, I purchased them last year.

The site of the principal potteries at that time was chiefly confined to the neighbourhood of the lower end of Dale Street, formerly called the Townsend, where stood the bank or works of Mr. Alderman Thomas Shaw, who carried on an extensive business, then occupying a very large space of ground. It may be seen by referring to the map of Liverpool, dated 1769, where it is laid down at the end of Fontenoy Street and Dale Street, and extends to Chorley Court, but there are no remains now recognisable save the private residence of Mr. Shaw, at present numbered 149, in Dale Street.

There is another specimen known to have been made by Alderman Shaw. It is a very large punch bowl, measuring 17½ inches diameter, made of the coarse brown native clay, smeared with a thick white glaze, the ornamented parts in blue colour, and representing a three-masted ship in full sail, with streamer flying at the masthead and union jack at the jib, having a lion for her figure head. This bowl was made for a Captain Metcalf, who commanded the Golden Lion, which was the first vessel that sailed out of Liverpool in the whale fishery and Greenland trade; and was presented to him on his return from his second voyage by his employers, who were a company composed of the principal merchants in Liverpool in the year 1753.

From this piece of ware we may reasonably conclude that, as it was no doubt the best the bank could produce, the quality usually made here was of the common delf style, for domestic uses. Although I have a few pieces which are of an ornamental form, with indented and raised work, evidently made in a mould, and as they are too large for general purposes, may have been used only on particular occasions.

There was, however, another pottery in Liverpool, situated in Harrington Street, at the back of Lord Street, where the art of printing on pottery

was first discovered by Mr. John Sadler, whose father was a favourite soldier of the great Duke of Marlborough, and was out with him in the wars in the Low Countries. Being lodged whilst there in the house of a printer, he obtained an insight into the art of printing, and on his return to England, after the accession of George I. to the throne of England, he from attachment to the house of Stuart, left the army in disgust, forfeiting all his arrears of pay, and retired to Ulverstone. Here he married a Miss Bibby, who was acquainted with two of the daughters of the Earl of Sefton; through their influence he removed to Melling, and shortly afterwards took the lease of a house and farm at Aintree, which bears date 1723, "made between the Right Hon. Sir Richard Molyneux, Bart., Lord Viscount Molyneux of Maryburgh, in the kingdom of Ireland, on the one part, and Adam Sadler, of Melling, gentleman, on the other part." But, being of an active turn of mind, he shortly afterwards commenced business as a printer in the New Market, in Liverpool, where he printed a great number of books, amongst which was one called "The Muse's Delight," containing a large collection of songs set to music, of which he was justly proud, as he was an excellent musician himself, and played upon several instruments, the violin being his favourite.

His son, John Sadler, having learned the art of engraving, and being out of his apprenticeship, bought from his father, Adam Sadler, a house in Harrington Street, nominally for the sum of 5s., and there he commenced business on his own account, in 1748. About this time he married Miss Elizabeth Parker, the daughter of Mr. Parker, watchmaker, of Seel Street, and niece of Mr. Fazackerly, silversmith, of Pool Lane. After getting a good business, some of his fellow-townsmen became jealous of him, and persuaded the corporation to remove him. They accordingly ordered him to remove, as none but freemen would be allowed to keep a shop in the town. On his disregarding this, they entered an action against him, which he defended, and, through the aid of Mr. Topping, gained his cause, the corporation not being able to prove their right to power of ejectment. This decision becoming known, many men from various other places, finding Liverpool a growing place, came and set up in business in the town.

Mr. Sadler gained his first idea of applying the art of printing to the ornamentation of pottery, from seeing some children stick waste prints,

which he had given them, upon pieces of broken earthenware that they had brought from the potteries to ornament their "baby-houses" with. This Mr. Sadler kept to himself; and seeing the value of the art thus suggested to him by that circumstance, after many fruitless trials, he at last succeeded in accomplishing his object. When he saw that his invention was nearly perfect, he communicated it to Mr. Guy Green, who had lately succeeded Mr. Sadler's father in the printing business. Guy Green, a poor boy, used to go and buy ballads, whenever he got a penny to spare, from Mr. Adam Sadler, the publisher of them, who, seeing he was a sharp lad, took him into his service, and encouraged him to honourable industry. This he had the pleasure of witnessing in after life, and of seeing his business carried on as respectably as when in his own hands. The two now conducted their experiments together, and ultimately entering into a partnership, determined to apply to the King for a patent, and accordingly procured all the requisite certificates and other papers necessary to show their claim to the discovery; but they consulted with their friends, however, who, feeling assured that so curious a discovery would not easily be found out, and consequently that a long time must elapse before others could injure them by opposition, and considering besides the great expense and delay attendant upon securing the patent, as well as the exposure of the method, the secret of which was of the utmost value to them, it was thought better to abandon the idea of a patent. The papers, consequently, were never used, which will account for their being now in my possession, I having obtained them from Miss Sadler, of Aintree, the only and still surviving daughter of the discoverer.

Several places have been selected as claiming the honour of the first introduction of the art which helped to make English pottery famous throughout the civilised world, and has done so much towards making its production one of the great staple manufactures of the country. There are computed now to be nearly 110,000 hands employed in connexion with the art, and, therefore, to set at rest the question of any doubt about it in future, I give the evidence from the original documents now in my possession, as follows:—

I, John Sadler, of Liverpoole, in the county of Lancaster, printer, and Guy Green, of Liverpoole aforesaid, printer, severally maketh oath, that on Tuesday, the 27th day of July instant, they, these deponents, without the aid or assistance of any other person or persons, did, within the space of six hours, to wit betwixt the hours of nine in the morning and three in the afternoon of the same day, print upwards of twelve hundred

earthenware tiles of different patterns, at Liverpoole aforesaid, and which, as these deponents have heard and believe, were more in number, and better, and neater, than one hundred skilful pot painters could have painted in the like space of time in the common and usual way of painting with a pencil; and these deponents say that they have been upwards of seven years in finding out the method of printing tiles, and in making tryals and experiments for that purpose, which they have now, through great pains and expence, brought to perfection.

JOHN SADLER.
GUY GREEN.

Taken and sworn at Liverpoole, in the county of Lancaster, the second day of August, one thousand seven hundred and fifty six, before Wm. Statham, a master extraordinary in chancery.

We, Alderman Thomas Shaw and Samuel Gilbody, both of Liverpoole, in the county of Lancaster, clay potters, whose names are hereunto subscribed, do hereby humbly certifye that we are well assured that John Sadler and Guy Green did, at Liverpoole aforesaid, on Tuesday, the 27th day of July last past, within the space of six hours, print upwards of 1200 earthenware tiles of different colours and patterns, which is upon a moderate computation more than 100 good workmen could have done of the same patterns in the same space of time by the usual way of painting with the pencil. That we have since burnt the above tiles, and that they are considerably neater than any we have seen pencilled, and may be sold at little more than half the price. We are also assured the said John Sadler and Guy Green have been several years in bringing the art of printing on earthenware to perfection, and we never heard it was done by any other person or persons but themselves. We are also assured that as the Dutch (who import large quantities of tile into England, Ireland, &c.,) may by this improvement be considerably undersold, it cannot fail to be of great advantage to the nation, and to the town of Liverpoole in particular, where the earthenware manufacture is more extensively carried on than in any other town in the kingdom, and for which reasons we hope and do not doubt the above persons will be indulged in their request for a patent, to secure to them the profits that may arise from the above useful and advantageous improvements.

THOMAS SHAW.
SAMUEL GILBODY.

Liverpoole, August 13th, 1756.

Sir,—John Sadler, the bearer, and Guy Green, both of this town, have invented a method of printing potters' earthenware tyles for chimneys with surprising expedition. We have seen several of their printed tyles, and are of opinion that they are superior to any done by the pencill, and that this invention will be highly advantageous to the kingdom in general, and to the town of Liverpoole in particular.

In consequence of which, and for the encourgement of so useful and ingenious an improvement, we desire the favour of your interest in procuring for them his Majesty's letters patent,

ELLIS CUNLIFFE.
SPENCER STEBBS.
CHARLES GOORE.

Addressed to Charles Pole, Esq., in London.

Thus it appears, from the evidence above given, that to Mr. Sadler we owe the art of printing on pottery; but that evidence is further confirmed by specimens now before you, an impression from a copper-plate engraved after a portrait of Frederick III., King of Prussia, done from an original, painted at Berlin in 1756. "J. Sadler, Liverp! Enam!" It is on enamelled copper. Besides the one now exhibited, there is another in the same style,

being a portrait of George II.; also the arms of the Bucks Society; a quart mug, with a well executed landscape; a number of square tiles used for ornamenting fire places, of various patterns, with figures, landscapes, sea views, &c.; a teapot with the crest of the family, and underneath:—

Good health and success
To the Right Honourable the Earl of Derby.
Long may he live,
Happy may he be,
Blest with content,
And from misfortune free.

All of these have the name "Sadler, sculptor." Others, again, have the name of "Green."

The author of a work on Liverpool,* at the close of the last century, says—"Copper-plate printing upon china and earthenware originated here in 1752, and remained some time a secret with the inventors, Messrs. Sadler and Green, the latter of whom still continues the business in Harrington Street. It appeared unaccountable how uneven surfaces could receive impressions from copper plates. It could not, however, long remain undiscovered, that the impression from the plate is first taken upon paper, and from thence communicated to the ware, after it is glazed. The manner in which this continues to be done here remains still unrivalled in perfection."

At the east end of Sefton Church, on the south side, near the vestry door, is the burial place of the Sadlers; on the gravestone of which is recorded—

Here lies the body of Adam Sadler, who departed this life the 7th October, 1768, aged 83.
Here lies the body of Mr. John Sadler, from Liverpool, who departed this life the 10th of December, 1789, aged 69.

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* The Liverpool Guide, by W. Moss, Liverpool, 1799, third edition, p. 107.

Also, the body of Elizabeth, widow of Mr. John Sadler, who departed this life the 25th of May, 1812, aged 88 years.

Requiescat in pace.

About this time Josiah Wedgwood was making a complete revolution in the art of pottery; and four years after Messrs. Sadler and Green's invention was announced to the world, Wedgwood brought out his celebrated Queen's ware. Eagerly seizing upon the new style of ornamentation invented in Liverpool, he immediately made arrangements with the proprietors for decorating his hitherto cream-coloured Queen's ware by their process; and accordingly, I find him making the plain body at Burslem, and sending it in that state to Liverpool by waggon, where it was printed, and again returned to him by the same conveyance, except in the case of those orders that must go by sea fit for the market. This he continued to do until near the time of his death, when we find, by invoices now in my possession, that ware was sent to Liverpool, and printed by Mr. Guy Green, as late as 1794. A little before this time, his manufactory at Etruria having been made complete in all other branches of the art, and the manufacture in Liverpool being much decayed, he engaged many of the hands formerly employed there. Amongst the indentures is the name of John Pennington son of James Pennington, manufacturer of china, dated 1784, to be taught the art of engraving in aquatint, and thus he was enabled to execute the printing on his own premises in Staffordshire, thereby saving the expense of transport to and fro.

In proof that Mr. Wedgwood did this, I may quote a few passages from letters to his partner, Mr. Bentley, in London. He says—

1776.—We wrote to Mr. Green in consequence of your letter, acquainting that a foreign gentlem. wanted a service of ware printed with different landskips, but that he would not confirm the order without knowing how many different designs of landskips we could put upon them.

Mr. Green's answer is:—

The patterns for landskips are, for every dish a different landskip, ruin, &c.; about 30 different designs for table, soup, and dessert plates, and a great variety for various purposes of tureens, sauce boats, &c.

1768.—The cards (address) I intend to have engraved in Liverpool, &c.

1769.—One crate of printed tea ware.

On the other hand I find letters from Mr. Green to Mr. Wedgwood:—

1776.—Your Mr. Haywood desires the invoice of a box of pattern tiles sent some time ago. As I did not intend to make any charge for them, I have no account of the contents. The prices I sell them for to the shops, &c., are as follows:—For black printed tiles, 5s. per dozen; green vase tiles, 4s. ditto; figured tiles, green ground, 4s. 6d. ditto; green figured tiles, 4s. ditto; half tiles for borders, 2s. 9d. ditto; rose or spotted tiles, 3s. 6d. ditto, &c.

1783.—I have put the tile plate to be engraved as soon as I received your order for doing it, but by the neglect of the engraver it is not yet finished, but expect it will be completed to-morrow.

1783.—Our enamel kiln being down, prevented us sending you the goods forward as usual.

1783.—The plate with cypher was done here. I think it would be best to print the cypher in black, as I am much afraid the brown purple that the pattern was done in would not stand an up and down heat, as it would change in being long in heating.

1783.—For printing a table and tea service of 250 pieces [D. G.] for David Garrick, £8 6s. 1½d.

1783.—Twenty-five dozen half tiles printing and colouring, £1 5s.

The last invoice I find from Mr. Green is dated

1793.—I am sorry I cannot make out the invoice you request of goods forwarded you April 4th, for want of having received your charge of them to me. Only directions for printing them came enclosed in the package.

1793.—To printing two fruit baskets, 1s.

This last item of course does not imply that Mr. Wedgwood had the chief of his work done here, but no doubt the articles were required to match some service previously sold, of which Mr. Green had possession of the copper plates. In the following year, Mr. Green retired from business to enjoy the fruits of his long and successful labours. The following memorandum in the handwriting of Mr. Sadler (from Mr. Sadler's receipt book in my possession, date 1766) will give an idea of the extent of their business.

J. Sadler and G. Green would be willing to take a young man, about 18, into partnership for a third of their concern, in the printing and enamelling china, earthenware, tile, &c., business, on the following conditions:—1st, That he advance £200 for his third part of the engravings and other materials necessary for the business, (N.B.: The engravings alone have cost above £800.) 2nd, That he should give his labour and attendance for twelve months without any share of the profits, in consideration of being instructed completely in the business. 3rd, After the expiration of the twelve months the stock of ware in the works should be valued, as low as is common in those cases, and he should immediately enter as a partner into the profits of the whole concern throughout, either paying the value for his third share of such stock, or paying interest for it till it is cleared off. The value of the stock is uncertain, being sometimes £200 more than other times, but, reckon it at the least, may be about £600. The sole reason of taking a partner is, J. Sadler not choosing to confine himself to business so much as heretofore.

There was another pottery near the bottom of Duke Street, in the short street still called Pot-house Lane. This was carred on by Mr. James Drinkwater, who was born in the neighbourhood of Preston, and an ancestor of the late Sir George Drinkwater. He married a Miss Leece, the daughter of a merchant after whom Leece Street was named. He had extensive works, for making earthenware of a coarse native clay body, smeared with a thick tin glaze, and ornamented with rudely painted subjects after Chinese types, in blue colour. A large plate of his make was presented to me by his grand-son, Mr. Alexander Syers, and is now in my collection.

A similar establishment existed at the bottom of Richmond-row, and was carried on by Mr. Thomas Spencer, who afterwards removed his works to near Prescot, where he started the "Moss Pottery," which is still carried on by his descendants; but it was as now confined to the making of common red-clay ware, for domestic use, as jowls, steins, flower-pots, &c.

Having traced the middle era of Liverpool pottery, we now enter upon the more pleasing part of the inquiry. It is that which relates to the transition from the rudely fabricated article made for necessary uses, to the commencement and gradual progress of the more refined work, and to the unequalled excellence in material, design, and execution, which at one time was unhesitatiugly awarded to the geniuses of the Ceramic art at Liverpool. At the bottom of Dale Street ran a small rivulet, covered over, on the east side of which was rising ground; and was the road to Mr. Shaw's works; from which circumstance the place was called Shaw's Brow. Here several works were established, and in a short time the whole of the Brow became one mass of potters' banks, with houses for the workmen on both sides of the street; and so numerous were they, that, according to the census taken in 1790, there were as many as 74 houses, occupied by 374 persons, the whole of whom were connected with the potteries.

Amongst the principal manufacturers who had banks here, was Mr. Richard Chaffers, born in Mersey-street, where his father lived, who was an eminent shipwright. Mr. Chaffers served his apprenticeship to Alderman Shaw, after which he commenced business on his own account: his works were situated on the north side, near the bottom of the Brow. Here, about 1752, he commenced making, in the usual style of that period, blue and white earthenware, which was exported to our American colonies, now the United States. Shortly after that time, hearing the report of the great improvements made by Wedgwood in the body of the ware, and finding Mr. Wedgwood a very formidable rival in the art of which he was then at the head, Mr. Chaffers was induced to aim at making a higher class of ware than had been produced here before. His endeavours now were turned to the production of china, the manufacture of which required an ingredient called soapstone, of which he was not able to procure any supply. It had not long before been discovered by Mr. William Cookworthy, in Cornwall, and the district where it was found had already been leased out to other persons. He saw that the days of the Liverpool manufacture were num-

bered unless the same material could be procured, which opinion was confirmed by a very clever person of the name of Podmore, who, although not a scientific chemist or geologist, was, nevertheless, a very superior practical man.

Mr. Podmore had been in the service of Mr. Wedgwood, but left it from a wish to establish himself as a manufacturer in America. On coming to Liverpool to embark for that country, he called upon Mr. Chaffers as the leading man in the trade. They entered into a long conversation, in the course of which Podmore exhibited so much intelligence and practical knowledge, that Mr. Chaffers, by a most liberal offer, induced him to forego his American project, and enter into his service.

Mr. Chaffers's object now was to come into the field with Staffordshire *pari materiâ*, if I may be allowed that play upon words. He therefore determined to set out for Cornwall upon the forlorn hope of discovering a vein of soaprock. The operations would be most expensive and laborious, somewhat akin to the process of boring for coal in our county. But where was he to begin—on whose estate was it to be found? what description of men was he to employ? He was, however, in the prime of manhood, of untiring energy, of fine address, and, what was then necessary, an excellent horseman. He obtained letters of introduction from the Earl of Derby, Lord Strange, his eldest son, and other men of consequence in our county, to some of the leading landowners in Cornwall, then attending their duty in Parliament.

In those days, there were no mail coaches and railways to aid the weary traveller. A stout horse was the only means of conveyance for a man of the higher class. Imagine Mr. Chaffers, having taken leave of his wife and numerous family and friends, mounted with a pair of saddle bags under him, containing a supply of linen, &c., a thousand guineas, the first instalment, to pay the wages of the miners, a brace of pistols in his holsters, pursuing his journey to London. He had made considerable progress in practical geology, though the science was then but little cultivated. Having, during his stay in London, obtained permission to bore for soaprock from more than one of the principal proprietors of mountain land he judged most likely to yield it, he proceeded to Cornwall and commenced operations. His first efforts were not successful. He moved to another quarter, with no better result: in a word, he expended large sums of money without finding the

wished-for vein. Somewhat disheartened, but not subdued, he determined to return home, where his presence was much wanted. He did not, however, intend to abandon, but only suspend, his operations. He accordingly assembled all the miners in his employ, and announced to them, to their great regret, his determination. Previously to his departure he scrupulously paid every man his wages. One of them was missing; he was told the man in question was gone up the mountain to try another place. He then left that man's wages in the hands of the "captain of the gang," and mounting his horse with a heavy heart, took leave of the men, to whom his animated and conciliatory manners had greatly endeared him.

The road to the nearest town, the name of which I never could learn, was precipitous and rugged. A traveller on horseback made so little progress that a mountaineer on foot, by taking a short cut over the rocky crags, could easily come within ear-shot of him. After journeying for some time, he thought he heard a faint cry in the distance. He dismounted, and, ascending a hill, plainly saw the signal of discovery flying from a lofty peak. It appeared that the man who had separated from his fellow miners, and pursued his researches alone, had discovered a vein; and on coming back to head quarters and, finding Mr. Chaffers had left them, he hoisted the pre-concerted signal, and pursued him across the mountain with the pleasing intelligence, shouting, at times, to attract the somewhat dispirited traveller's attention.

Mr. Chaffers immediately returned, took the whole gang into permanent employment, and obtained an ample supply of the long sought for clay which was conveyed to the nearest port, and shipped thence to Liverpool. On its arrival, the vessel entered with its precious freight into the old Dock, dressed in colours, amidst the cheers of the assembled spectators.

During his absence, Mr. Chaffers had regularly corresponded with his wife; but on his arrival in London, on his return home, the continued fatigue he had endured, together with anxiety of mind, brought on a dangerous fever, under which he laboured for several weeks. He was unknown at the inn where he stayed; but the landlord seeing that his guest—a very handsome man—had the dress and demeanour of a gentleman, called in an eminent physician, who sedulously and skilfully attended his patient. The doctor examined his saddle bags, and, having ascertained his name and address from the letters and papers therein, communicated

to his anxious wife all the particulars of his illness, and concluded with the consoling intelligence, that "he could that day pronounce him out of danger." As soon as he could travel he delighted his family and friends with his presence in Liverpool.

No sooner had Mr. Chaffers arrived at home than he set to work with his new materials, and soon produced articles that gained him much reputation, as was frankly acknowledged by the great Wedgwood, to whom Mr. Chaffers presented a tea set of his chinaware, and who, on looking at one of the cups, admiring the body, and examining the colours used in decoration, exclaimed, "This puts an end to the battle. Mr. Chaffers beats us all in his colours and with his knowledge; he can make colours for two guineas which I cannot produce so good for five!"

But of how short duration was this distinguished progress. The sad tale of the sudden death of this eminent citizen remains to be told. Podmore, his favourite foreman, was seized some years after the events narrated with a malignant fever, without hope of recovery. The unfortunate sufferer sent a message declaring "his wish to see his dear master once more before their final separation." Mr. Chaffers, a man of full and sanguine habit, most imprudently complied, and shortly after took the fever, to which he fell a victim. He was interred in the old churchyard of St. Nicholas, near the grave of his faithful servant. It is said that when Mr. Wedgwood heard of the sudden death of Mr. Chaffers, like a generous competitor he exhibited sincere regret, and acknowledged that he must ultimately have yielded the palm to his rival in certain branches, from his superiority as a chemist, his profound knowledge of the art of compounding colours, and their more economical preparation. This unfortunate event, by taking away both master and principal assistant, put an end to the prosecution of the trade, and was the commencement of the breaking up of that branch of the art which Mr. Chaffers had mainly brought to such a high state of perfection. A great number of the potters ultimately emigrated to America, whilst many of the best hands transferred themselves to the service of Mr. Wedgwood, or were hired by other Staffordshire manufacturers. There is a portrait of Mr. Chaffers by Caddick. Mr. Chaffers's private residence was at the corner of Dale-street and Old Haymarket, now pulled down. Of the specimens produced by this eminent

potter I have several in my collection of English pottery, one of which is a pepper box of the hour-glass shape, painted in blue enamel colour with a chequered border at top and bottom, and the name, "Richard Chaffers, 1769," round the waist of it. So well known was the ware of Mr. Chaffers in the American Colonies, that it was a common saying of a person who was angry that "He's as hot as Dick's pepper box," alluding to those made by Mr. Chaffers, who exported a very large quantity of his manufacture to the then English colonies.

Another piece is a tea cup, painted with a figure and landscape, after the style of India china, which, for cleverness of manipulation in the throwing, the almost egg-shell thinness of its sides, the compact solid body, with the smoothness of the glaze, and the deep richness of the brilliant colours, may be compared, without any fear of disparagement, with the large punch bowl of oriental make that stands beside it—the identical bowl that Mr. Chaffers kept as a pattern for his workman to copy from. It was preserved in his family until recently presented to me, along with the pepper box and tea cup, by his grandson, John Rosson, Esq., of Moor Hall, near Ormskirk, whose mother was the daughter of Mr. Chaffers, and who related to me many of the particulars of his career. Other pieces in my collection are a tea pot, tea caddy, and a cream jug, painted with figures and landscapes, after the Chinese style; also a large punch bowl, painted with flowers and festoons, presented to me by Miss Mather, of Mount-pleasant; also a quart jug having a portrait of Frederick the Third, King of Prussia, on each side of which are trophies of war: in the inside are painted a war trophy and sprigs of flowers, and at the bottom is the Prussian Eagle. This was given to me by Charles Chandos Pole, Esq., a descendant of one of the early Liverpool families, whose grandfather was the member of Parliament to whom the letter was addressed in favour of Messrs. Sadler and Green, the inventors of printing on pottery.

In March, 1761, commenced one of those strongly contested elections for members of Parliament, for which Liverpool has long been notorious. The candidates were Sir William Meredith, Bart., Sir Ellis Cunliffe, Bart., and Charles Pole, Esq., and from the poll and squib book, published after the election was over, and printed by John Sadler, we find that 102 potters voted for Sir William, all of whom gave plumpers, which carried the election. Indeed, they could do this whenever they were so minded, the pottery trade at that time being the most staple manufacture in the town. Amongst the songs on that occasion was one for the craft of the clay, entitled :—

THE POTTER'S SONG.

To the tune of "Ye mortals whom fancy," &c.

ADDRESSED TO THE PLUMPING POTTERS.

Ye true hearted fellows, free plumpers and men,
Independent in Britain, how great is your claim!
Not power without candour can soothe with a smile,
Or forms of vain grandeur e'en fancy beguile.

CHORUS.

And thus sings the parent of liberty's cause,
If my son you would be,
If my son you would be,
Like Britons undaunted—like Britons be free!

Tranquility, heightened by friendship's supply,
Degraded may censure—with malice stalk by!
Auspiciously reigning—those plumpers they say,
Unluckily carry the spoils of each day.
And thus, &c.

Regardless of great ones, we live uncontrolled,
We're potters and plumpers, we are not to be sold:
No purchase but merit can cheapen such souls
Thus circled in friendship we live by our bowls.
And thus, &c.

Regained—now preserve the true blessing of choice,
And strike at the wretch that would blast a free voice:
Thus rich in possession of what is our own,
Sir William's our member—Squire Charley may moan.
And thus, &c.

The next works on the Brow were those of Pennington, whose father, John Pennington, was a maltster, and married a Miss Johnson, of Everton, by whom he had three sons—James, John, and Seth. His oldest son, James, had a pottery in Copperas Hill; John, the second son, carried on a large "bank," near the corner of Upper Islington and St. Anne's street. Seth, the youngest, had pot-works on Shaw's Brow, which were very large, extending as far as Clayton-street, which were carried on with great spirit; and, requiring more help to conduct it, he took

as a partner, Mr. Part, but the connection did not last long. Here he produced china, of which the larger pieces, such as vases, punch bowls, &c., have often been sold for oriental make, and, indeed, are almost of an equal quality with that renowned material. I have several specimens of this ware. This group is part of a set of chimney ornaments,

which I purchased at the latter end of last year from Miss Pennington, of Everton-terrace, who is the only child of Mr. Pennington now alive, and kept them as relics of her father's manufacture.

But, prior to his making of china, Mr. Pennington was celebrated for his punch bowls, of which he made many very large ones, the earliest of which has in the inside a ship in full sail, and underneath is written, "Success to the Monmouth, 1760." The outside is ornamented with birds, a butterfly, and trees, done in bright yellow and green. It was presented to me by Mrs. Twentyman, of Duke-street. Another punch bowl has a subject on the outside, two sailors, one sitting on the stock of an anchor and holding in one of his hands a punch bowl, in the other a

sword; the other sailor sits astride a barrel, whilst between them is a large chest or box, on which is written "Spanish Gold." Inside the bowl is a ship in full sail, and underneath is "1779, success to the Isabella;" the whole done in blue colour.

The largest punch bowl I have seen is one made at this manufactory; it is 20½ inches in diameter, and stands 9 inches high. The ornaments are painted in blue colour. It has on the outside a landscape, with horses and trees, a church in the distance, and in the foreground two bridges, on which stand two men fishing in the water below. In the inside of the bowl is a group, consisting of ships and boats, surrounded by a deep border of trophies of warlike instruments, flags, swords, drums, trumpets, &c., arranged in six groups, which are divided by different kinds of shot, namely, chain, crescent, arrow, or triangle, shell with fusee burning, cross or bar, and grape shot, under which is written, "Success to the Africa trade. George Dickenson." The description given with this bowl is as follows:—

"John Robinson, a pot painter, served his time at Pennington's, in Shaw's brow, and there painted this punch bowl." Mr. Robinson removed (after the breaking up of the Liverpool potteries) to Burslem, and presented the bowl to the Pottery Mechanics' Institution at Shelton, in Staffordshire, where it now is (1855). Another group of this make consists of large vases for flowers, ornamented with landscapes, birds, and flowers, the covers formed of lions sejant holding shields. The whole of the designs upon them are painted in blue. This group, as well as the bowls,

are all of earthenware of a good compact body, and good glaze.

Mr. Pennington was celebrated for making a very rich blue colour, for the recipe of which he was offered by a Staffordshire house 1000 guineas; but he refused the offer, as it was a source of great profit to him, being kept so secret that none ever mixed the colours but himself. But about twelve months after the offer was made to him, another manufacturer produced the same tint of colour. It was said that his brother James, having

persuaded him to tell the secret to him, and being a wild and extravagant young man, who had run through all his property, which he spent in dissipation, afterwards in a drunken fit divulged the secret to one of his pot companions, who immediately sold the recipe to the Staffordshire potter, and by this means the establishment of a rival in making their celebrated blue colour, destroyed the monopoly which he had created by his industry. After this disgraceful and thoughtless act, James Pennington and his family removed to Worcester, where one of his children painted a dinner service for the Duke of York, which at that time was considered to be a beautiful specimen of the art. It had a figure of Hope with an anchor upon each piece,

John Pennington, of Upper Islington, sold his bank to Mr. Wolf, who being a scientific man, made great improvements in the ware, but ultimately, finding it did not answer, as the Staffordshire potters were making such rapid strides towards monopolizing the whole trade, he gave up the manufacture, and the works were closed, never to be resumed.

One of the ovens of Pennington's works is still standing in a yard at the back of the houses, near the centre of Shaw's-brow, and is now used as a mill for grinding emery, being in the occupation of Messrs. Johnson, Brothers, chemists, of Church street.

In a recipe book of Mr. Sadler's is noticed—

Pennington's Body, March 18, 1769.—Bone ashes, 60 lb.; lyme sand, 40 lb.; flint 35 fritt. To every 60 of the above 20 lbs. of clay.

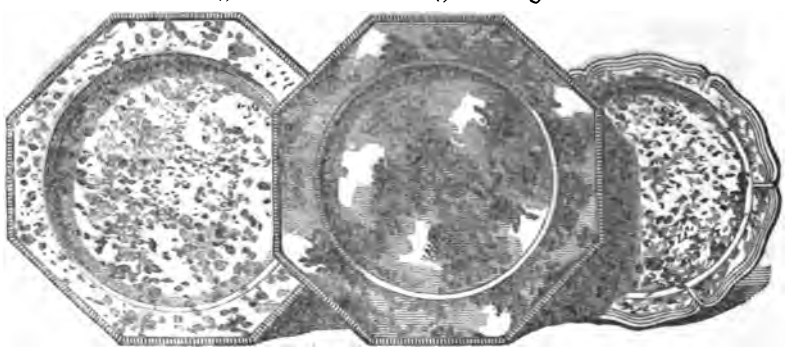
Mr. Pennington's private residence was the house numbered 79, on Shaw's-brow—now Dick's Temperance Coffee House; besides which he had a town house in Button-street, then a fashionable neighbourhood.

Higher up in Shaw's-brow was another potwork, belonging to Mr. Philip Christian, whose works were situated on the present site of Islington-terrace, and whose residence was at the corner of Christian-street, from which circumstance the street took its name. Here Mr. Christian carried on an extensive manufactory of china, and after the death of Mr. Chaffers, he took the lead amongst the Liverpool potters, and produced many fine specimens of ware in dinner and dessert services, as well as tea and coffee sets, together with many very elegantly formed ornaments for the chimney piece, and the corner cupboard, which it was then the fashion to decorate with choice bits of china. It is said that when placed alongside the more costly oriental china, this porcelain showed with great effect by its brilliancy of colour and glaze—the body being very compact and transparent. In a memorandum book, formerly belonging to Mr. Sadler, I find noticed, January, 1769—

Christian's China Body.—To 100 parts rock; flint, 24 parts; best flint glass, 6 parts; small glass, 6 parts; crown glass, 6 parts. To every 20 lb. of the above put 1 lb. of salts.
Glaze.—4 china body (foreign); 16 flint glass; 3 white lead; 12 oz. pearl ashes.

Of Mr. Christian's ware there are some specimens which show a great perfection in the art.

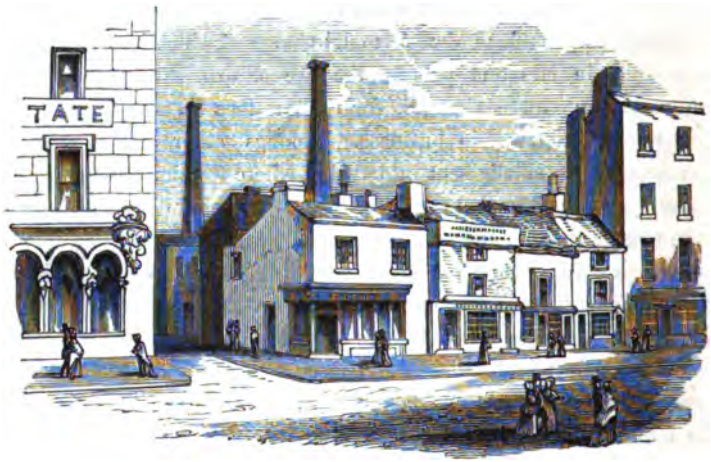
Amongst other kinds of ware made here by Mr. Christian was the tortoise-shell ware, of which the large square bowl, and the octagon and round plates are specimens. They were presented to me by Mrs. Rockliffe, of Clare-terrace, Edge-hill, who is the granddaughter of Mr. Christian.



Zachariah Barnes was a native of Warrington, and brother to Dr. Barnes, of Manchester. He was born in 1743, and died September, 1820, being interred at the Baptist burial ground, Low-hill. He commenced business as a potter in the Old Haymarket, on the left side, going towards Byrom-street. He first made china, but afterwards gave up that class of ware, and confined himself to delft ware, of which he has left many good samples in jars and pots for the use of druggists, the labelling of which underwent three changes, from alterations in the pharmacopœa during the time he was in business. Amongst other articles were very large round dishes, chiefly sent into Wales, where the simple habits of their forefathers remained unchanged long after their alteration in England; and the master of the house and his guests dipped their spoons into the mess and helped themselves from the dish placed in the middle of the table. Quantities of this ware were sent to the great border fairs, held at Chester, whither the inhabitants of the more remote and inaccessible parts of the mountain districts of Wales assembled, to buy their stores for the year. This continued until a very recent time, when, in consequence of the formation of good roads through the districts, and the introduction of railroads, the business of the great fairs held in the border city of the two countries has materially diminished. The quality of this ware was very coarse, without flint, with the usual delf-like thick tin glaze. But Barnes' principal forte lay in the manufacture of square tiles, then so much in vogue, and the use of which is now reviving. So excellent were they, that I believe there are none now made that can bear comparison with them in squareness and evenness, as well as in the superiority of the body and durability of the glaze. When these tiles were required to be printed, that part of the work was done by Messrs. Sadler and Green. So large was the sale of this article, that Mr. Barnes has been heard to say he made a profit of £300 per annum by his tiles alone, he having a monopoly of the trade; he also made large quantities of potting pots for Char, which were sent to the lakes. The ovens were fired with turf brought from the bogs at Kirkby, and on the night of firing the men were always allowed potatoes to roast at the kiln fires, and a certain quantity of ale to drink.

Several specimens, marked 16, 17, and 18, were presented to me by his daughter, Mrs. Wedgwood, now living at Bebbington, in Cheshire.

This was the last pottery of the old established locality carried on in Liverpool, of which that part of the premises, occupied as the showroom and warehouse, are still standing.



The Herculaneum pottery was situated on the south shore of the Mersey, near Liverpool. A pottery was first started on this site by Richard Abbey, in conjunction with a Scotchman named Graham, about the year 1794, where they carried on the business with good success for some time, but Mr. Abbey's love of rural life induced him to abandon the concern; and they sold it to a company.

Mr. Abbey had served his time as an engraver to Mr. Sadler, in Harrington-street, where he engraved, besides many other works, a copperplate for a large quart jug, having upon it the farmers' arms, and was considered very skilful in his art. He afterwards went to a pottery at Glasgow, to teach the art of engraving, and afterwards to a manufactory in France, for the same purpose. He was born at Aintree, and after selling his bank retired to his native place, and there died in 1801, at the age of 81, after breaking a blood vessel whilst singing in Melling Church, where, being a good musician, he used to lead the choir on a Sunday. He was buried at Walton.

After the retirement of Mr. Abbey, the works were taken by Messrs.

Worthington, Humble, and Holland, and they engaged Mr. Arch. Mansfield,* who was a thrower at Burslem, in Staffordshire, as their foreman, along with about 40 operatives, men, women, and children, to be employed in the various branches belonging to the art. After enlarging and remodelling the works, and the little group of emigrants, who were chiefly from Staffordshire, being ready to start, their employers gave them a dinner at the Legs of Man public house, at Burslem, to which a few of their friends were invited. There they spent the parting night in jollity and mirth; and at a late hour, in conformity with an old Mercian custom, still prevalent in some parts of Staffordshire, the parting cup, was called for, and each pledged the other to a loving remembrance when absent, and a safe journey, with a hearty goodwill. Next morning, at an early hour, they started on their journey, headed by a band of music and flags bearing appropriate inscriptions, amongst which was one, "Success to the Jolly Potters," a motto still met with on the signs of the public houses in the Staffordshire pot-districts. When reaching the Grand Trunk canal, which runs near to the town of Burslem, after bidding farewell to all their relatives and friends, they got into the boats prepared for them, and were towed away amid the shouts of hundreds of spectators. Now, however, came the time for thought: they had left their old homes, the hearths of their forefathers, the joys of acquainted neighbours, and were going to a strange place. Still the hopes of bettering themselves were uppermost in their thoughts, and they arrived at Runcorn in good spirits, having amused themselves in various ways during their canal passage, by singing their peculiar local songs, which, as "craft" songs, perhaps stand unrivalled in any employment; for richness of material, elegance of thought, and expression of passion and sentiment, and it is to be regretted that many of them are daily becoming lost. Amongst other amusements was one that created much merriment—drawing cuts for the houses they were to live in, which had been built for them by their employers; and as they had not seen them nor knew anything about them, the only preference to be striven for, was whether it should be No. 1, 2, 3, &c.

* Archibald Mansfield after having left the "Herculaneum" had erected pottery works at the north end of Liverpool, in a street out of Bevington Bush, on a moderate scale—having a grinding mill, with a twenty-horse power engine, three glost and one biscuit oven. The articles made were of an ordinary description, such as were suitable for hawkers in the country trade, and for export. This manufacture ceased at his death.

At Runcorn they stayed all night, as the weather was bad and the river very rough, after one of those storm-days frequent in the Mersey, when the waters are lashed by the wind into such fury that few boats dare venture out, and many who had never seen salt water before, were afraid to trust themselves upon it in a flat. Next morning, November 11, 1796, the wind had subsided. They embarked on board the flat, and at once, with a fair wind, got into the middle of the Mersey where it becomes more like an inland sea surrounded with lofty mountain ranges. This much surprised the voyagers, alike by its highly picturesque beauty and the vast extent of water. They had a pleasant voyage down the river, and arriving at their destination were met on their landing by a band of music, and marched into the works amidst the cheers of a large crowd of people who had assembled to greet them. Thus commenced the peopling of the little colony called Herculaneum,* where, a few years ago, on visiting the old nurse of my father, who had accompanied her son there, I heard the same peculiar dialect of language as is spoken in their mother district, in Staffordshire, which to those not brought up in that locality is nearly unintelligible.

The site of the Herculaneum Pottery was formerly occupied by Copper-works; and for some time after the bank was in full play, the ware which they made had a slight tinge of green, given to it by the remains of small particles of the debris of the copper still adhering to the floor and walls of the workshops. It will be seen from the lease,† that the first proprietorship was composed of

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* (*From the Liverpool Guide, by W. Moss, Liverpool*, 1799, *p.* 107.)
A manufacture of Queen's ware, upon the plan of the Staffordshire potteries, has lately been established on the south shore of the river, about a mile above the town.
(*From Gore's General Advertiser, Vol.* 31, *No.* 1616, *dated Thursday, Dec.* 13*th*, 1796.)
On Saturday last, the new pottery (formerly the copper works) near this town was opened, and a plentiful entertainment given by Mr. Worthington, the proprietor, to upwards of 60 persons employed in the manufactory, who were preceded by a military band from the works along the docks and through Castle-street. Two colours were displayed on the occasion—one representing a distant view of the manufactory. We have the pleasure to say these works are very likely to succeed, from their extent and situation, and will be of infinite advantage to the merchants of Liverpool.

† *Extract from Schedule of the Deed establishing the Herculaneum Pottery*, 12*th Nov.*, 1806.
"Indenture between Daniel Howard of Nether Knutsford, surgeon, of the 1st part, John Pownal of High Leigh, gentn., of the 2nd part, Elizh. Mathews of Neston, widow, of the 3rd part, Wm. Hutchinson of Neston, gentn., of the 4th part, Saml. Holland of Sandle Bridge, gentn., Wm. Boult of the City of Chester, gentn., Peter Holland of Nether Knutsford, surgeon, John Boult of Liverpool, mercht., executors named and approved by the will of Peter Swinton late of Nether Knutsford, tanner, deceased, of the 5th part, Saml. Worthington of Llwynan, near Bangor, mercht., of the 6th part, Michael Humble of Shooters Hill, near Bawtry, mercht., of the 7th part, Saml. Holland of Liverpool, merchant, of the 8th part, Archibald Keightley of Liverpool, gentn., of the 9th part, Saml. Bersey of Edge Lane, near

VIEW OF THE HERCULANEUM POTTERY, FROM A SKETCH BY J. MAYER, TAKEN SEPTEMBER, 1833.

three gentlemen, Mr. Worthington, Mr. Humble, and Mr. Holland, who carried on the manufactory until 1806, when an enlargement of the works requiring more capital, an increase of proprietors took place. Their first meeting was held on the 28th of November, 1806, and so continued until 1833, when the company was dissolved, and the property sold to Ambrose Lace, Esq. and others, for the sum of £25,000, who let the premises to Thomas Case, gentleman, and James Mort, potter, and they carried on the business until 1836. After this time it was held under Mr. Lace by Messrs. Mort & Simpson, who manufactured here until its ceasing to be a pottery in 1841, the site being now occupied by the Herculaneum dock.

The first ware made here, Nov. 11, 1796, was blue printed, and had the name "Herculaneum" painted in blue at the bottom of it. The first piece was a chamber-pot, made by Edward Roberts, who was a thrower, and who, about two years afterwards, made the punch-bowl (No. 19), and used it for the first time at the christening of his second child (the first being born eight months after he settled there). This bowl was lately presented to me by his wife. One pattern that was made here

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Liverpool, mercht., of the 10th part, and the said Saml. Worthington, Michael Humble, Saml. Holland of Liverpool, Archd. Keightley, Saml. Berey, John Menzies, gentn., Edwd. Blackstock, gentn., Wm. Fawcett, mercht., Adam Stewart, mercht., Wm. French, mercht., Robert Jones, silversmith, John Harding, mercht., George Rowe, gentn., George Orred, gentn., Richd. Sutton, gentn., Richd. Harden, silversmith, Latham Hanmer, gentn., Henry Lawrence, mercht., Wm. Cartwright, book-keeper, Wm. Harding, mercht., and Anna Hird, spinster, all of Liverpool, the said Wm. Hutchinson, Benjn. Rawson of Darley, near Bolton-in-the-Moors, mercht., John Holland of Bolton-in-the-Moors, mercht., John Moore of Halsall, gent., John Holland of Nether Knutsford, gent., and Ralph Mansfield of Toxteth Park, near Liverpool, manufacturer of earthenware, and present manager of the Herculaneum Pottery, of the 11th part, and James Cropper, mercht., Saml. Thompson and Hugh Jones, Bankers of Liverpool of the 12th part.

"Reciting to this effect, that by Indenture of Lease bearing date the 1st of May, 1772, between the then Earl of Sefton, of the one part, and Charles Roe deceased and others, of the other part.

"The said Saml. Worthington became possessed of all that Parcel of Land which did belong to the said Earl of Sefton——called the Lower Croft, the Roughs, and the Great Sea Hey, parcel of the sd. Park called Toxteth Park, &c. * * *

"And further reciting (amongst other things) an indenture of a Lease bearing date the 31st of Octor., 1800, made between the Rt. Honble. Wm. Philip, Earl of Sefton, of the one part, and sd. Saml. Worthington, Michael Humble, Saml. Holland of Liverpool, and Nichs. Hurry, of the other part, the sd, Wm. Philip, Earl of Sefton, in consideration of the sd. Saml. Worthington, Michl. Humble, & Nichls. Hurry who had become purchasers of the Premises by the sd. 1st mentioned Lease, demised, relinquishing and giving up certain rights and Privileges by the 1st mentd. Lease granted and for other the considerations, therein mentd. Did demise and grant unto the sd. Saml. Worthington, Michl. Humble, Saml. Holland of Liverpool, and Nichls. Hurry their Exrs. Ads. & Asss. all those parcels of Land within Toxteth Park, called the Roughs, Parcel of an Estate in Toxteth Park, called Parr's, and also all those Cottages and Buildings erected and made thereupon, and also all that Farm House and Dwelling House, and tenements, with the Barn, outbuildings, and the two Gardens thereunto belonging, adjoining to the same premises, &c.——To hold—for the term of 50 years——at the yearly rent of £94 10s., &c."

had on it views of the principal towns in England, the names of which were printed in blue at the bottom of the articles.

About the year 1800 the company commenced making china. The first oven was fired by Thomas Walls, who worked prior to that time at the bank in Shaw's-brow. At this period Ralph Cordon was the manager or bailiff, and had the care of mixing the bodies, both of china and earthenware. He was one of the first settlers, and came in the capacity of dish-maker, being a native of Gravelly-bank, near Lane-end, now called Longton.

The examples of this pottery are—No. 20, a punch bowl of blue printed earthenware, named before. This was printed by the bat process, the impression being taken from the copper on a flat substance composed of glue and treacle, which, being very pliable, fitted in all the uneven surfaces of the article to be ornamented, and was in some cases preferable to the usual mode of transferring on paper. I purchased it from Mrs. Roberts. No. 21; a slop bowl and tea cup and saucer of china was purchased from Mrs. Pool, the daughter of Mrs. Roberts, who painted the last piece of ware made at the works,—a large jug, which she ornamented with groups of flowers. No. 22 is a quart mug, blue printed, having a frog sitting in the inside. On the front are the initials "R M C," it being made for Ralph and Mary Cordon, two of the original colonists, and presented to me by their son, Mr. Sampson Cordon, who was formerly a printer at the works, but left on the breaking up of the concern, and is now clerk to St. Michael's church, Toxteth-park. Nos. 23, 24, 25, 26, consisting of a tea and coffee cup and saucer, and plate, of china, are part of a set, which were given by Ralph Cordon, on his second marriage, to his wife, from whom I purchased them. These were printed in oil, and the colour afterwards dusted upon them—a method now rarely used. No. 27, a bas-relief, representing the fable of the Golden Egg. No. 28, an oval placque, having on it a print of the figure of Hope. No. 29, an oval placque, painted with a ship. These three I purchased from Mrs. Till, who formerly worked at the bank, and still resides at Herculaneum.

Of the marks used on this ware, the earliest was "Herculaneum," printed in blue. After that, by a resolution of the Committee of Management, dated August 6, 1822, it was ordered that "to give publicity and identity to the China and Earthenware manufactured by the Herculaneum Pottery Co., the words "Herculaneum Pottery" be stamped or marked on some

conspicuous part of all China and Earthenware hereafter made and manufactured at this manufactory;" and lastly, the Liver was used by Messrs. Case, Mort and Co.

There is now a small manufactory at St. Helens, which may be considered the last relique of pottery in this neighbourhood, (excepting the works at Seacombe,) but that concern has been unoccupied for some time. Some years ago the manufactory was fully worked as an adjunct to the works of Messrs. Case, Mort and Co.

There has been a revival of the manufacture of pottery again in this neighbourhood, and works were built at Seacombe, in Cheshire, on the opposite side of the Mersey from Liverpool, in 1851, under the proprietorship of Mr. Goodwin, who was formerly a manufacturer at Lane-end; the workmen coming chiefly from Staffordshire. The first oven was fired on the 19th of June, 1852. That there are advantages in this locality for such works is not doubted, as coal can be had nearly as cheap as in Staffordshire. The quality, I believe, is not quite so good, being more bassy, and consequently not burning so clear as that used in the great pottery district. There is also a great saving, in carriage, as the raw materials, such as clay, Cornwall stone, and flint, can be laid down on the quay close to the works; and, again, when packed and ready for the market, vessels can load in the great float at Birkenhead, and at once proceed to sea without reshipment, as is the case with the Staffordshire ware on its arrival at Runcorn.

The ware manufactured here at present consists principally of earthenware and stone ware, chiefly of blue and colour printed ware, and lately, parian has been made of a good quality. Here has been introduced one of the throwing tables for making hollow ware, cups, bowls, &c., by machinery, with the aid of which four boys, who are quite unacquainted with the art, can in a day or two's practice, produce as much work as by the old process of hand throwing could formerly be made by five men in the same space of time. The success of the undertaking may be considered fairly established, and a very large and increasing trade is now carried on with the east and west coast of South America, Turkey, California, and India. So admirably arranged are the buildings on this work, that all the different parts work together. The ware after being fired is carried direct from the ovens into the bisque warehouses which adjoin them, and on the other side the coal is conveyed along a railway and deposited close to the mouths

of the kilns. The whole may be looked upon as a model for all future buildings and arrangements for pot-works. Indeed, so perfect is it, that it has been visited by several manufacturers from France and Germany, who by permission of Mr. Goodwin have taken plans of it, as a guide for new works to be erected in those countries.

In terminating my memoranda of the rise and progress of pottery in Liverpool, my observations must necessarily be few, as I have given the principal data from which I have derived my information; but in order that others who are in a better position than myself to carry on the inquiry, may have a clue to more information, or may have friends who are in possession of documents that will throw further light on the subject, I have given below* a few memoranda that I met with in my researches. The

* (*From Williamson's Liverpool Advertiser and Mercantile Register.*)

June 18, 1756.—The proprietors of the Mould Works, near the Infirmary, Liverpool, acquaint the public that they continue to make all sorts of sugar moulds and drips, chimney moulds, large jars for water, black mugs of sizes, crucibles and melting pots for silversmiths, founders, &c., and sell them on the same terms as from Prescot, Sutton, and other places. Direct to the proprietors of the Mould Works, Woods and Co.

Nov. 19, 1756.—Liverpool China Manufactory.—Messrs. Reid and Co., proprietors of the china manufactory, have opened their warehouse in Castle-street, and sell all kinds of blue and white china ware, not inferior to any make in England, both wholesale and retail. Samples sent to any gentlemen or ladies in the country that will pay carriage, good allowance for shopkeepers and exporters.

Dec. 10, 1756.—Chaffers and Co., China Manufactory.—The porcelain, or china ware, made by Messrs. Richard Chaffers and Co., is sold now here in the town; but at their manufactory on Shaw's-brow, considerable abatement for exportation, and to all wholesale dealers. N.B. All the ware is proved with boiling water before it is exposed for sale.

March 19, 1758.—This is to acquaint the publick that Messrs. Reid and Company, proprietors of the china manufactory, have removed their warehouse to the top of Castle-hey, and hope for the continuance of their friends' favours.

Nov. 3, 1758.—Messrs. Reid and Company want immediately apprentices for painters in the Liverpool China Manufactory.

Oct. 31, 1760.—Thomas Deare and Company humbly beg leave to acquaint the public, that they have opened their warehouse, commonly known by the name of Patrick's-hill pot-house, and are now making all sorts of the best blue and white earthenware; where all commands will be punctually observed and gratefully acknowledged by, gentlemen, your humble servants.

July 25, 1760.—Wanted, immediately, several apprentices for the china work. Also, a sober careful man, who understands sorting and packing of ware, and merchants' accounts. Such a person, on good recommendation, may meet with encouragement by applying to Mr. William Reid, in Liverpool.

Nov. 6, 1767.—Died, Mrs. Leadbetter, wife of Mr. Thomas Leadbetter, potter.

April 24, 1767.—Died, Mrs. Williams, wife of Mr. John Williams, potter.

Jan. 29, 1768.—Died, Mr. Thomas Hunter, potter, Shaw's-brow.

Feb. 4, 1774.—Flint Potworks. Rigg and Peacock beg leave to acquaint their friends and the public that they have taken and entered on the Flint Potworks, upper end of Park-lane, near the Pitch-house, lately belonging to Mr. Okell, deceased, where they intend carrying on the business of making all kinds of cream-coloured earthenware, &c. Those who are pleased to favour them with their orders may depend on being well served, and on the lowest terms, by their most humble servants,

RIGG & PEACOCK.

following letter was given to me by the Rev. Dr. Raffles. The writer was a man of considerable ability as an artist, employed at the potteries here, and alludes to engraving in aquatint, a style then recently discovered by Mr. Paul Sandby, of London, who was in the habit of spending much of the summer of many years with his friends Mr. John Leigh Phillips, of Manchester, and Mr. M'Morland, in Liverpool, to which place he came down to paint and sketch from nature.

TO HIS MAJESTY THE KING OF PRUSSIA.

Sir,—I presume to acquaint your Majesty that in making some chemical experiments I have now discovered a new, expeditious, and beautiful manner of engraving upon copper, so as to make impressions transferable to porcelain, and which, when vitrified, resemble and equal the most delicate paintings.

The great fame of the Berlin fabric, under the immediate patronage of a monarch who can distinguish the merit of improvements at first sight, strongly compels me to lay so important an article at your Majesty's feet. Could I be encouraged to hope that abilities like mine deserve so much honour.—I am, great sir, with the utmost veneration, your Majesty's obedient servant,

PETER PEVER BURDETT.

Liverpool, February 21, 1773.

In a bill of expenses incurred by David Rhodes, in the employ of Mr. Wedgwood, who was evidently commissioned to look out for specimens of the various styles of ware then made in England, I find the following items :—

1775, May	10th.—A Flawed Chelsea Leaf, a Plymouth Teapot, and 2 Liverpool Coffee Cups	0	6
„	12th.—A set of Bristol China	6	0
„	A ½ pint Worcester Bason and broken ware	0	6
„	2 Slop Basins Derby and Leastoff	1	6
„	1 Quart Bristol Mug and Teapot Stand	2	6
„	A Broken Quart Mug, Bristol	0	6

A view of the works, with the Cheshire shore in the distance, was used for the certificates of the shareholders of a Female Friendly Society or Club instituted there soon after the settlement, in imitation of those existing in Staffordshire. It was engraved by Codling, Liverpool.

As many of the varied processes practised in the art of pottery are of extreme delicacy in the manipulation, I was determined that it should no

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Oct. 20, 1775.—Died, Mr. Samuel Shaw, potter, Dale-street.

Dec. 3, 1779.—Died, on Saturday, in an advanced age, the wife of John Baxter, formerly a potter in this town.

On Tuesday last the said John Baxter died of an apoplectic fit, which seized him in the street. They were buried in one grave.

Mar. 7, 1782.—Monday evening, about ten o'clock, a fire was discovered at the china works on Shaw's Brow, but was happily prevented from spreading further than a part of the building.

longer remain a mystery, and it was for the Exhibition, which took place at the Mechanics' Institution, in the year 1840, that I engaged Mr. Mollart, an acknowledged proficient in that part of the art, technically called throwing, (which is the first process used by the potter, it is the formation of the vessel from a lump of raw clay,) to exhibit his art, which was the first time it was shewn to the public. In this I was encouraged by the help of my brothers, Messrs. Thomas, John, and Jos. Mayer, who lent me a potters-wheel, and presented me with some casks of clay, ready prepared for use, With these Mollart set to work making all sorts of forms and sizes of vases, cups, bowls, &c., as suggested to him by the bystanders. By his practiced hand and correct eye, he produced some of the most elegant and beautifully formed classic shapes that can be conceived, alike delighting, and at the same time astonishing the visitors, by the facility and rapidity with which he made them. Many of these articles were afterwards fired in a tobacco-pipe maker's kiln, in Hurst Street, there being at that time no pottery in Liverpool.

After the closing of this Exhibition, seeing the great interest the people took in the hitherto unseen art, I sent Mr. Mollart to various other places where similar Exhibitions took place, namely, to Manchester, Preston, Leeds, Sheffield, Hull, &c., and, finally, to the Anti-Corn-Law League Bazaar, held in London, where he drew large companies around him, to witness the skill and dexterity which he displayed in his art, and the surprising power he had over the clay.

I need scarcely say that I am much indebted to several persons who have presented me with authenticated specimens of Liverpool pottery, and for their valuable aid in my endeavors to form a collection of this ware. To all of them, I beg to offer my best thanks.

Remarks on the connection between Archæology and Natural History.

By Joseph Clarke, Esq., F.S.A., Hon. M.H.S.

(Read 22nd March, 1855.)

When I pass in review through my mind, the men of mark and likelihood who have gone before, who have, in a pre-eminent degree, combined the two, and after exhausting one science as far as their limits of observation

and research permitted them, have almost naturally turned to the other, I am led to the conclusion that the connection between these two scientific occupations must be closer than is at first imagined; and that the same faculties of mind which qualify any *savant* for the pursuit of one, equally fit him for the study of the other. Thus for an example in remote ages, Pliny, celebrated for a noble work on natural history, has introduced us to a profound knowledge of antiquities, and from him we learn the history and construction and decorations of those edifices which, even in this country, where from its distance from the Roman capital they must be considered as inferior, occasionally astonish us by their beauty, when excavations have accidentally brought any of them to light. And in mentioning this production of Pliny, it is to be regretted that there is no scholar of the present day, who is conversant enough with the above two studies to give us a new translation of this great work; but from the rapid strides now making by learned men, who are becoming naturalists and antiquaries, it is to be hoped that this will not be much longer a subject of regret.

A little knowledge of natural history would be a great acquisition to a literary antiquary, would prevent many misconceptions, and enable him to avoid many a blunder. As an illustration I will begin with the mediæval antiquary, the idolizer of Shakspeare, who, when the harmless and inoffensive toad is mentioned or alluded to, in his misconstruction of the matter, starts off with the celebrated and hackneyed lines,

> "The toad, ugly and venomous,
> Wears yet a precious jewel in his head."

Sentences more at variance with nature and common sense could not have been penned, and their absurdity is still often heightened by their application in quotation. Let us remark on the different points in order.

1. Art may fashion monsters, credulity may be frightened by its own conjurations, and imagination shadow forth hideous forms, and people its world with demons; but there is nothing placed upon earth by the creator which we have a right to call "ugly." Nevertheless there are forms even in nature which it requires the eye to be accustomed to to appreciate. But our poor toad has had to encounter the ignorance of nursery-maids, and the ill-grounded fears of weak and over credulous mothers, who impart to the young susceptible mind a horror of it, and the moment it is seen it is either shunned or often cruelly persecuted, whereas a little watching of its slow

and harmless motions, a little accustoming of the eye to its form, would soon familiarize it to the senses, and it would appear anything but *ugly*. A pet of ours was frequently introduced upon the tea-table, just at the time of evening when it began to shake off its drowsiness. At first it was looked upon with that sort of dread which unenlightened parents, in their ignorance, had succeeded in instilling into infancy; but it soon became very palpable that there was nothing to be feared from the creature, and after a while it began to be considered very amusing. As the eye became accustomed to it, all idea of ugliness vanished, and even admiration was accorded to some of its parts; in fact, of its kind it was a beauty. The proverb "as ugly as a toad" has done a great deal towards keeping up the absurd notion, and fairy tales, too, often deal largely in poisoning by toads.

2. Who ever knew from his own observation, or from reliable or respectable authority, of any body or any thing ever being poisoned by a toad? or of any injury that ever accrued from one? It is true that I once did, but it was not the fault of the creature itself, but that of the animal which swallowed it. A sow swallowed * a toad alive, which is under all circumstances exceedingly retentive of life, (for I once knew one live in a pot of turpentine all night, and crawl off, apparently unharmed, in the morning.) Here in its uncomfortable porcine prison, in its endeavours to free itself, it forced one of its claws through an intestine, inflamation ensued, and the sow died. But venom was out of the question, nor ought the death of the animal to be laid to the charge of the poor incarcerated toad, for you may depend upon it, it is incapable of doing the slightest injury. The toad has the advantage of being able to exist in the two elements of air and water, but activity on land it has none. Hide itself it may, and its means of protection from its wanton tormentors and pursuers is increasing its size by distending its skin to the utmost, evidently that a blow may fall with less violence upon its bones; the inflation also tending to protect its lungs and viscera from being crushed. Its only means of defence is the expulsion of a very disagreeable liquid, secreted against the time of need,

* Swine are very voracious, and will devour almost anything that comes to hand. Animal matter of any kind is generally much to their taste; snakes they eat with avidity. Thus in the backwoods and uncleared regions of North America, the first care of the settler is to locate on his wild woodlands a herd of pigs, which at once busy themselves in freeing his newly acquired possessions from that dangerous denizen of the wilderness, the rattlesnake, as well as others of the genus.

which, when teazed or attacked, it readily ejects. This liquor is supposed to be poisonous. Not many years ago, a beautiful spaniel, fond of catching anything that shewed signs of life, frequently amused himself by catching and carrying a frog about, no doubt to the great inconvenience of the reptile; and often have I seen him pick up a toad, and smiled to observe how quickly he set it down again, and to get rid of the ejected offensive matter he suspended his tongue from his jaws, most copiously lubricated with saliva; but no harm came of it, nor did it deter him from doing the same thing again. Moreover, that this fluid is innocuous I can give personal evidence, having tasted a considerable quantity of it, without, it is needless to say, any harm accruing; but I can also bear testimony to its being indescribably nauseous, so much so, that it was a long time before I could get rid of the abominable flavour from my mouth. Yet it had not the effect upon my tongue that poisonous matter would have had.*

Yet we sometimes hear strange things from eye-witnesses. An old friend of mine, and a sensible man too, has several times indulged me with the recital of what he asserted to be a *fact;* that he had witnessed a large spotted toad seize a poor snake by its head, and while the snake was screaming with pain and terror, the venomous brute dragged it to a pool of water, and plunged in with it. Though my friend was of a temper not easily exasperated, he was so incensed on this occasion, that he threw stones after it, but he feared not with precision enough to save the snake. So convinced was he of all this, that is was quite useless for me to explain to him that the toad (*Bufo vulgaris*, FLEMM.) and the frog (*Rana temporaria*, LINN.) were the natural food of the snake (*Natrix torquata*, RAY.), whose capacity of swallow is enormous, almost beyond conception, and which is often found lying in wait for its prey by the side of rivers and pools and in swampy meadows. The snake had really siezed the toad, (frog, I suspect; I am not aware that toads scream as frogs do,) which was strong enough

* A worthy professor now living, saw a man in the fens of Ely catching snakes; on enquiring what he did with them, the answer was that he sent them to London, and on being asked how purchasers could be found for them, or what became of them in that city, he said he did not know, but he had orders for four or six dozens at a time occasionally, and he sent them up with their skins off! The professor's curiosity being roused, he determined, if possible, to ascertain their destination, and found it to be a celebrated eel pie establishment; and he came to the very reasonable conclusion, that when eels were scarce, these snakes were partially or wholly substituted. The Indians of North and South America consider snakes as delicacies; why should they not be thought so in Europe?

to drag its captor into an element where it could better deal with it, and thus instinctively rid itself of its antagonist. The adder or viper, (*Vipera communis*, LEACH), as well as the common snake, often visit water-meadows and fenny-lands in search of amphibia; and in the fen counties, where frogs, tritons, and toads abound, there snakes and adders abound also.* The authority of the ancients would bear my friend out in this error; for attached to a finger-ring, some six centuries old, in the cabinet of Lady Londesborough, is a toad, well sculptured, swallowing a serpent, though possibly this might have been connected with the notion then entertained, "that a serpent must eat a serpent, to become a dragon." If so, it would appear that our forefathers, supposing it to be noxious, put the toad in the same category, and considered it as one of the race of serpents.

3. I now come to the "precious jewel in its head;" and here will be found a little piece of the superstition of the age in which the poet lived; and probably the immortal bard himself, when penning these lines, was under the influence of a myth. That the toad has *two* beautiful eyes, may be ascertained by any one who is disposed to look at them on a bright sunny day; and after having noted the rich colour of the iris, the elongated pupil, and their general mild brilliancy, he will not easily forget them. I should recommend all persons to judge for themselves, for it would be an approach towards softening down the vague ideas of ugliness, and would engender a more kindly disposition towards this harmless animal in future. It would be a first step towards that familiarity of vision, which, in this case, seems requisite to admiration. But the bard of Avon alluded not to the eye. From remote ages there has been a belief in spells and counter-spells, and charms and anti-charms; superstitious notions have ever been rife, more than one attaches itself to the reptile in question. Thus Pliny says, in his days, if a certain little bone taken from the right side of a toad were put into boiling water, "it would presently boil no more," and the bone from the left side would cause the water to become warm again.

* There is a lurking notion still among some portion of the educated classes, that the exudations from the follicles or tuberculated excrescences of the covering are venomous, and cause irritation of the skin, like the stinging of a nettle. I have picked up so many, and seen others in the delicate hands of ladies, that if this had been the case we should have found it out; therefore, this also may be consigned, as an error, to oblivion. As to the toad being capable of inflicting any injury by biting, this is another fallacy, as it has no teeth, and the horny consistency of its jaws would not enable it, by any effort, to make an incision in the skin of the most delicate finger; added to which, during the severer season its mouth is naturally closed, nor could it be opened without positive laceration.

The bone from this side, carried about the person, facilitated an inducement to love, while that of the contrary side produced an opposite effect. These bones were also a charm against curst dogs. The way in which they were obtained, was by incarcerating the toad in an ant-hill, an extremely cruel experiment, as the poor victim would be literally stripped of its skin and flesh while living; and I fear some of the junior osteologists of the present day are not clear of this sin. The skeleton of this creature, from its minuteness, is difficult to articulate, (or put together by wires), but if taken from the ants before the natural ligaments are destroyed, the specimen only requires bleaching, and putting into position. Pliny also says, that the milt, and more especially the head, is a counter-poison against its own venom. Something of this remains with us at the present day; for in the medicine chest of a British admiral, I saw a small bottle of viper's fat, as a remedy by application for the bite of deadly serpents. In the first of these counter-poisons against the pretended venom of the toad, I should have the most implicit faith; the viper's fat antidote I should be very sorry to test. But it was in the head of the toad that a stone was supposed to exist, which was the grand counter-charm, and was eagerly sought after, because the person possessing it, was supposed to have protection against all the evils arising from spells. Various ways are mentioned by the elder writers for obtaining this stone, most of which concur in stating that it must be taken out while the animal "is yet palpitating." Among the supernatural attributes ascribed to it, is, that if swallowed, it will drive out any poisonous matter from the intestines. It was also good against storms, and as a charm against drowning. Our sailors, for a similar reason, still have a superstitious reverence for the caul which envelopes the head of a newly-born infant. An old author on the serpent tribe, says there is a precious stone in the head of a toad, and many wear it in rings, "being well persuaded that it is good against gripings, and internal pains." Another writer says, it is good for the stone in the bladder. Another, that in the presence of poison, it will become hot, and even change colour; and virtue is attributed to it against the falling sickness. There was also much dispute between these elders about how, or by what means, it is engendered. The most general way of disposing of this fictitious stone, as well as one of the safest, was by setting it in a ring; and some of those which have been preserved, when seen in a peculiar light, have a tuberculated appearance,

and are said to be of shell imported from the East; but doubtless there were a variety of impositions; and there is one regarding a green stone vomited from the mouth of a snake, even now prevalent. In the celebrated picture of the money-changers, painted sometime about the year fifteen hundred, by Quintin Matsys, a duplicate of which is at Audley End, one of the misers has a toad-stone ring on his finger, no doubt for the purpose of guarding himself against spells, and protecting his wealth from all evil influences. In this picture, too, on a stool, are several of those coin like pieces that are now called Nuremburg tokens, which have so long puzzled numismatists, but they were probably used as counters in calculation. It was this ideal stone, to which all sorts of fancied virtues were ascribed, that the poet indicated, when he penned the beautiful lines above quoted, and various* allusions are made to it by other writers of the middle ages.

The toad is said to attain extreme length of years; and in this view it may deserve a passing thought of the antiquary as well as of the naturalist. This may easily be believed, since it appears to be a rule in nature, that those species of animals which arrive slowly at maturity, enjoy the longest periods of existence; and as the toad is not adult until its fifth year, we may take it for granted that many years are allotted to it. Twenty years is no uncommon time for it to have lived in captivity; and in a state of nature probably, "barring accidents," double or three times that period would not end its term of life. I knew of one which lived in a small enclosed garden for more than thirty years; in the dormant months of winter it hid itself in some hole or secluded corner, but during the active months presented itself at intervals, sometimes daily, opposite the kitchen window, for its accustomed allowance of bread and butter. It had attained a large size, but it unfortunately became the victim of prejudice, and was killed by a new servant; I say unfortunately, for all this time it was well carrying out the test of longevity, besides being a most useful occupant of its little domain, freeing the garden of slugs, catterpillars, woodlice, and all the other pests which gardeners so much complain of; and in no

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* Lyly in his "Euphues," has

"The fowle toad hath a faire *stone* in his head."

And in his play of the "Fox," Ben Jonson says—

"What, was your mountebanke their call? their whistle?
Were you enamour'd of his copper rings,
His saffron jewel with the *toadstone* in it?"

instance had it ever done the slightest harm. There can be no question of its tenacity of the vital principle in case of accident, a quality bestowed upon it to make up in some degree for its utter helplessness on land, and of its entire want of the means of defence. It has the most astonishing powers of restoration after injury, and many a poor fellow, left for dead by wanton boys, has revived, and nature has repaired the damage done it so quickly, that in a very short space of time it has to all appearance been as well as ever. Yet injury to a serious extent would seem to shorten its life, for those in confinement which have been badly wounded, though recovering with extraordinary quickness, have paid the forfeit at no great distance of time. In man, three quarters of a century is rather a common period for his dissolution. Occasionally a favoured individual seems to despise age, and Parr nearly doubled this term. This occurs also with other animals; and the cold-blooded reptiles may carry this exception even to a still greater extent. Thus Belzoni, after clearing a passage leading into an Egyptian temple that had been for ages buried in the sand, found a toad of large size in it, which he conjectured, from its having no means of egress, must have been of great age. A doubt may be hazarded whether this was either of our British species *Bufo vulgaris* or *calamita*.

The stories of toads being cut out alive from solid stone or timber must be received with great suspicion. I can readily believe that an animal of this species can live for a considerable time in a hole or cleft of a tree, its own growth, and the yearly lessening of the aperture, precluding the possibility of escape. Here rain, dew, and sap supply it with moisture, and numerous small insects may find their way in, and the creature's aptitude for catching these is almost surpassing belief. You see a fly settle in near approximation to it, you could easily have seen it fly away, but it is gone! for without the slightest movement of its body the tongue of the toad has conveyed it to its mouth with a rapidity that has eluded your vision. A builder of respectability told me, that when a boy he had helped to build a wall across a garden, and finding a large toad, made a hollow for it, and built it in, marking the outside brick with a deep cross. Years after, the wall was ordered to be pulled down, and he hastened to seek the dormitory of the imprisoned object. He found it very sluggish, and not materially altered in appearance. But as far as my knowledge is concerned, most of the experiments made to test this quality of endurance

have proved failures. One of our professors of anatomy invariably at a year's end found his prisoner dead: his plan was to put the reptile in a garden pot, covered with a piece of glass, and then to bury it. My friend Mr. John Brown, of Stanway, an eminent Essex geologist, keenly alive to those parts of natural history and archæology which in any way relate to his peculiar study, caused several toads, covered with garden pots, to be buried three feet deep. At the end of four years, and he conjectured they must have died at an early period of their immolation, no part of them could be found. One, however, he found alive, very much reduced, its hinder parts particularly attenuated. Moisture it had from the earth, and possibly a worm or insect may occasionally have forced itself into the dreary habitation. Without thinking of the consequences, he removed it from its dark chilly abode into the bright warm sunshine, the change was too sudden, and it soon ceased to exist. Here is at least an instance of one having lived four years in a state of incarceration, but that any one could do so without air or moisture is more than questionable.

Before bidding adieu to the bard of Avon, let me point out another misconception of very frequent quotation—"every dog will have its day." Those persons who are acquainted with the early editions of Shakespeare, put forth to the world when printers were not so erudite as they are now, are very well aware of the erratic position of many letters as well as sentences, and a *b*, *d*, *p* and *q* might easily have been substituted for each other. Thus in the last word of the line quoted, the *b* may have become a *d*; the line as it stands, when analyzed, contains no very distinct meaning. The life of a dog is a short one, it is true; ten or twelve years generally terminate its existence. With the writers of Shakespeare's day, "bay" and "bark" were synonymous, and the former word was frequently in use among the poets, and in fact is so now, being the more euphonious word of the two. Horace Smith, in his "Zillah," has—

> "* * * * * . Hark
> How Scylla and Charybdis bark!
> They *bay* the moon, as if they strove
> To tear her from the skies above."

Byron has—

> "'Tis sweet to hear the watch-dog's honest voice
> *Bay* deep-mouth'd welcome, as we draw near home."

And in the song of the "Wolf," so admirably set to music by Shield—

> "When the wolf with nightly prowl,
> *Bays* the moon with hideous howl."

Both these last seem to have been borrowed from some older line—

"*Bays* deep-mouth'd thunder to the waning moon."

And from the antecedent line of Shakespeare, it seems evident what he intended—

"* * * the cat will mew,
And every dog will have his *bay*."

The "bay" of the dog, is here used in contradistinction to the "mew" of the cat; thus a familiar adage has positively become established on a blunder of the printers.

The digression, or rather series of digressions, which nearly seduced me into the natural history of the toad,* leads me to a near approach to that of the serpent, with which archæology has been largely connected from very remote to late mediæval times, but this subject would require many papers and much abler hands to exemplify. In passing, however, I will give one example from the ancients of the belief in their powers of fascination, and endeavour to illustrate the cause of this belief, which, I think, can be accounted for without any great stretch of the imagination. In the interesting tessellated pavement of the temple of Fortune, found at Præneste, the depicted scenes on which are entirely Egyptian, there is a serpent in the act of charming a flight of birds; two of the flock are falling, and one

*It is well known that this animal sheds its skin periodically, previous to which time its mouth had been closed for a season, after which it becomes free; and a lady friend of mine told me that more than once she had seen a pet of hers gorge its cast-off skin; and I myself saw a very fresh looking, but inactive creature, apparently half choked by its nearly finished meal, with the exuvia of one of its legs hanging from its mouth. The dauntless and celebrated arctic voyager, Sir John Richardson, after having exhausted all his provisions, describes his breakfasting off his boots; but our innocent friend's first meal, after his long fast, is its old jacket! And this casting its slough is one link in the creation in connection with the serpent tribe. If what I have written should have the effect of causing this poor almost helpless reptile to be treated with a little consideration, and its entire harmlessness and great usefulness to be understood, I shall be amply repaid for this or any other exertion I may make in its favour. I have always endeavoured to protect it whenever I have found it. I have watched it with great interest, looked at its beautiful eyes, and noted, when purposely interrupting its passage towards a pond, how it puffs out its sides, and instinctively becomes larger, that the anticipated blow may fall with less effect upon its bones; and on its near approach to the water how quickly it becomes less, just before it quietly glides into its other element. I may state that there are two distinct species, which, until late years, have been confounded as one, and are so still, except amongst the initiated: the toad (*Bufo vulgaris*, FLEMM.), and the natterjack or mephitic toad (*Bufo calamita*, LEACH). In some counties of England one prevails, and in other parts of the kingdom the other numbers the most specimens. In the midland counties they appear to be about equal. The latter becomes impatient of confinement and soon sickens. By a little attention they are easily known apart; and the quiet sedate *hop* of the toad is readily distinguished from the *run* of the natterjack. You will miss the rich hazel in the eyes of the latter, they have a yellower hue, the eyelids are much more prominent, the neck is longer, and the nose more obtuse.

is already in its mouth. This reptile, in common with others, has its own peculiar instinct in procuring its food; and leaving fascination out of the question, sudden fright will often cause paralysis, even in the human species. In the lower creation two instances of it have fallen under my observation. One was, a horse running down a street, the vehicle to which it was attached came in contact with some iron railing connected with stone steps, and carried a portion away with great noise. The mistress of the house shrieked with alarm, a canary bird (*Fringilla canaria*, LINN.) in its cage fluttered its wings, and with a short cry fell dead from its perch. As it was evening, and the shutters were closed, this death was from *auricular* fright. The next was this; a gentleman brought from abroad a sulphur crested cockatoo (*Psittacus sulphureus*, LATH.); being found too noisy to retain, the cage with the bird in it was put upon a table for a person to look at, with a view of sale. A cat jumped suddenly up, on which the bird screamed, and instantly expired; unlike the other, in this case the fright was *visual*. A serpent coming suddenly upon a bird might produce the same effect. Then again, people who walk much about the fields know that many species of the feathered tribe simulate lameness, and even death, to decoy any intruder from an approach to their young; and how many youths in fancying they were going to catch a wounded partridge (*Perdix cinerea*, PENN.) have thus been seduced from its helpless progeny. A friend* seeing some of the young of the willow-wren (*Sylvia trochilus*, PENN.) just emancipated from the nest, who with their parents were perched upon a bush, and from the promise their very immature appearance gave, he attempted to catch one of these young ones with his hat, when suddenly an old one fell, as if dead, to the ground. While he was looking for this, the young birds escaped, and the old bird had taken good care to creep away in the long grass; by which species of instinctive dissimulation it saved its young one from capture. But the serpent's intuitiveness would probably, from the quickness of its movements, have made this affectionate little parent its prey; and a bird hovering over a serpent, with a view to induce it to leave the vicinity of its nest, may, in its forgetfulness of self, in solicitude for its young, or from fright, become a victim. These are some of the causes which keep up the delusion of the fascination of serpents.

Of the eminent men who have pursued archæology and natural history

* Mr. John Young Akerman.

in conjunction, Pliny has been mentioned. Pallas, though acquiring a first class reputation as a naturalist, did not lose sight of antiquities; and our own Leland stands prominently forward in the cultivation of the two pursuits, as also does the gentleman-like Pennant, and the enthusiastic and accomplished Edward Daniel Clarke, as his travels amply testify. Borlase, Peck, Richardson, Thoresby, Plott, and many others, might be mentioned; and Donovan, the industrious author of "British Zöology," has given us "Descriptive Excursions through South Wales," with elaborate accounts of its antiquities. Boys, the author of an admirable book, "Collections for a History of Sandwich," has not been unmindful of its natural history; his taste for antiquities has descended to his grandson, Mr. W. H. Rolfe of that place, whose museum is ever open for all useful purposes; nor must I omit that most amiable writer the Rev. Gilbert White, whose "Natural History and Antiquities of Selbourne" have been the delight of youth and age, and his successor at Selbourne, Professor T. Bell, author of "British Quadrupeds," and "Reptiles," by no means leaves antiquities unstudied. Of your own honorary members, we sometimes find the Woodwardian Professor of Cambridge (Sedgwick) relaxing from the weightier studies of that extensive and important branch of natural history which is his particular walk in Science, to mingle with the antiquaries; and another professor (Henslowe) of that university, whose knowledge extends to all branches of natural history, we find opening barrows, and forming a museum of antiquities. A second on your list, Mr. C. C. Babington, having obtained a proficiency in British botany rarely surpassed, and otherwise devoted to natural history, follows out the pursuit of archæology with equal ardour. In every archæological expedition Dr. Buckland of the sister university was always foremost, in looking well into the natural history of the district; and that indefatigable explorer and author in the primæval fields of antiquity, the Hon. Mr. Neville, has also made a study of natural history. Mr. Akerman, author of several works on antiquities, and compiler of the "Numismatic Manual," takes an enthusiastic interest in natural history; and Mr. Yarrell, the author of a most scientific and delightful work, "The History of British Birds," and another on "Fishes," is carrying out the numismatic branch with avidity. The author of "Reliquiæ Isurianæ," Mr. Ecroyd Smith, is no mean botanist, and is perfectly alive to all the works of nature; and Mr. Westwood, while

following out the arduous pursuit of entomology, has published a valuable work on antiquities. And the Saxon antiquary, Mr. Thomas Wright, another of your honorary members, has written an article on fabulous natural history, in which he states that the "Bestiaries" of the middle ages, relate that the elephant is afraid of a mouse. But this is not entirely a fable; an immense animal, belonging to that prince of showmen of wild beasts, George Wombwell, was one day drawing himself up into a corner of his den, and shrieking with affright, not only causing consternation to his visitors, but attracting the attention of his keepers, who were at a loss to conjecture what could ail him; at first it was supposed the floor of his carriage had given way, as he looked so intently to one part of it; but on removing the straw, out jumped a mouse; so terrified had the bulky and powerful animal been that it was some time before his perturbation could be allayed. The only idea the keeper had on the subject was, that the elephant feared the mouse would get into his trunk.* It would be taxing your patience, or the foregoing list might be carried to a long extent of both ancient and modern names, but still from this very incomplete catalogue you will be naturally led to the conclusion that the two pursuits are not incompatible. It is, however, that branch of natural history denominated Ethnology which is destined to cement the union more firmly.

Natural history and archæology are blended in the name of the ancient town of Saffron Walden, and the architect who studies both will not fail to admire its light and elegant church, or to make out the saffron flower (*Crocus sativus*, LINN.) sculptured on some of the spandrils. The arms of the town are three saffron buds, surrounded by a castellated wall. The botany of one of the most accomplished antiquaries of the present day must have been floundering in the mud of the Fleet-ditch, or surely his eyes were dazzled by the flaunting show of handkerchiefs of Field-lane, when in his admirable paper on the "River Fleet", he supposed "that its continuation, Saffron-hill, might once have been *yellow* with this flower," for its petals are of a delicate purple, as are all the autumn-blooming varieties, and not *yellow*, as the most common of our spring crocuses is; and a field of saffron, with its crimson stiles (these latter being the only part constituting its commercial value,) must have had a very gaudy appearance.

* This animal, which had attained the age of a hundred and twenty years, has just been destroyed, from incurable infirmity in its feet.

To the traveller both sciences would be found useful and essential, for when disappointed of his hopes in one, he could generally take refuge in the other. In visiting the ivy-mantled ruin, if no historic or archæological value attaches to it, its inhabitants the owls and the bats may interest him, the little bird that builds its nest in the corner may amuse him, and the insects lurking in their hiding places among the ivy, or humming around its blooms, may arrest a passing moment; while the wood through which he may have strolled, besides presenting many an animal, bird, insect, or flower, may shadow forth to him in its tall trunks and intermingled branches, the gothic pile and fretted aisles, while the taller trees that tower above, would suggest the spire and pinnacles. In an avenue of aged lime trees, (*Tilia Europæa*, LINN.) he would be impressed with the idea of clustered columns and tall pointed arches most completely: in fact, a gothic cathedral is nothing more than an elegant imitation of a forest scene in stone. In the capital of a column of the Corinthian order is generally seen a sculptured representation of the leaf of the *Acanthus spinosa*, a plant belonging to a natural order, the most highly developed in the vegetable kingdom, thus showing a concordance between the most beautiful in form among plants, and the most beautiful in architecture. In his travels abroad, the naturalist-antiquary might stop for a moment to survey almost in an archæological point of view, the patriarchal olive-trees (*Olea Europæa*, LINN.) of Gethsemane, which I point out to his notice from the assumption of their great age by a French botanist, who conjectures it may be two thousand years, though he is probably mistaken. The average age of an English oak (*Quercus rober*, LINN.) is two hundred years, though, doubtless, many in favoured situations may double that period. If a transverse section could be obtained from the bole of any of these trees, the number of concentric rings would indicate its age to a certainty. But it often happens that young trees spring up, at or near the place where their predecessors stood, as in the case of Hearn's oak, in Windsor forest, which as they become old, having no mediæval historian, are in after years mistaken for the original trees. And speaking of these ancient trees, the thought suggests itself to me, that in searching for more of those interesting antiquities, which your Secretary has so well elucidated, in connection with the submarine forest of Hoylake, the botanist might be equally well employed in seeking the fruit, and ascertaining the species, and the age, of the different stumps which are now studding the beach at low-water; and

even in rescuing from the mud the remains of some of those primæval insects which in days of yore inhabited that forest. And here the microscope opens a wonderful field to the inquirer, and it has been brought to the service of the antiquary in examining the moulds for Roman silver coins, chiefly of the time of Severus, found at Lingwellgate in Yorkshire, which instead of being formed of the ashes of any particular wood, plastic cement, or any other extraordinary material, as would be the case now, are simply composed of the clay of the district, the microscope having clearly tested this by showing the infusoria to be of the same species. Thus ready were the Romans in the adaptation of materials. In all their works we find striking illustrations of this, as in their mosaic floors, in the construction of which they freely used such materials as they found upon the spot, importing others that were required. Another instance is furnished by the walls of Chester. Where any of the Roman walls or foundations exist, they appear as imperishable as when first built, but the mediæval structure erected on them is crumbling to decay. On closer inspection, every Roman stone will be found to have its peculiar silver-grey lichens (*Urceolaria scruposa*), while those of the middle ages have a different species, which the eye of the naturalist will not be long in detecting. This has enabled our primæval antiquary, Mr. C. Roach Smith, to distinguish with accuracy the portions of the existing wall which belong to either people The short time which I had to spend in the examination of these walls left me no time for a searching investigation into this interesting part of my subject. The Romans seem to have been quite aware of the perishable nature of the new kind of red sandstone in the immediate vicinity of Chester, and with that judgment so invariably displayed by them, they rejected it, and with their usual industry, worked a quarry of the old-red sandstone, eight miles distant. The Rev. W. H. Massie, of that city, says, "the older portion of the wall is of the peculiar strong-grained sandstone from Helsby Hill, some ten miles off." But the moderns wanted both the industry and discrimination of their predecessors, and hence the state of the mediæval part of the walls of Chester.

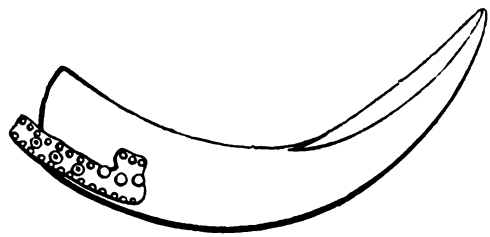
Another proof of the want of attention to this point in the middle ages has been suggested to me, namely, that scarcely a tombstone that has been exposed can be found two centuries old, whereas on the Roman altars and inscriptions, some of them ten times that age, the legends, where un-

mutilated by violence, retain their sharpness, and the material is still sound. The inscription at Goodwood, of the reign of Claudius, relating to the temple of Neptune and Minerva, is composed of one of the most indestructible materials of this country—the marble of Purbeck, an interesting geological production of this kingdom, now nearly exhausted. A Roman altar, of the highest interest, dedicated to the *Deæ Matres*, discovered in pulling down a church at Winchester, and fully described in his "*Collectanea Antiqua*," by Mr. C. Roach Smith, is found to be of Quarr-Abbey-stone, from Binstead, in the Isle of Wight. These quarries were granted by William the First and William Rufus to the bishops of Winchester, for the building and repairing of their cathedral, and are still visible, though out of use—this stone having been superseded by that from Caen, in Normandy, and the oolite productions of our own island of Portland. The Roman walls of Colchester, though built principally with flint, and other stones of the neighbourhood, are bonded together with tile-bricks of a very superior description, as far as material is concerned, to any which the mediæval ages have produced; but the projecting round towers occasionally exhibit pieces of *scoria*, which must have been introduced from some volcanic region, probably Italy, and the quern, or mill stones, discovered there, as elsewhere in deserted Roman habitations, are found to be of a deposit of lava, from a quarry near Andernach on the Rhine. The uppermost stone of a Roman-quern very much reduced by abraision, the aperture for the stick used in turning it being worn through to the under surface, rendering it useless, was lately (1855) found at Maidstone and is now in the possession of Mr. C. Roach Smith. It is pronounced by Mr. Brayley to be trachitic lava, containing pyroxene crystals of augite; none of which substance is found in England, and but a very small portion in the north-west of Ireland; though it is abundant at Andernach, and other places on the Rhine. Nor will it lessen our astonishment of their judgment in selection when we know that the moderns have been wise enough in this instance to follow their example, as the best mill stones used in England at the present day come from that same vicinity. In the explorations of walls and ruins, in exhumations of ancient cemeteries, and the opening of barrows, amidst articles of great historic and antiquarian value, bones, horns, celts of flint, and of other materials, stones, and pieces of marble continually come to light.

Skeletons, in Saxon barrows, are sometimes surrounded with a row of flints, and next to them a row of small bones, and in one instance the body had been completely covered over with small bones, which were ascertained to be those of the water rat (*Arvicola amphibia*, DESM.), a species confined to banks of rivers and ponds, injuring the trees by gnawing off the bark for their store, and not visiting the habitations of man. The old English black rat (*Mus rattus*, LINN.) was not then known, having, centuries since, been introduced from India. And that pest, now so common, the brown or Norway rat (*Mus decumanus*, PALL.), which has exterminated the other race, being a native of Persia, had not inflicted a visitation on this kingdom previous to seventeen hundred and thirty. It seems to be a law in nature that the weaker should disappear before the stronger; thus, our partridge (*Perdix cinerea*, BRISS.) disappears before the red legged or French partridge (*Perdix rubra*, BRISS.) wherever it is allowed to exist. And even man is not exempt; the Red Indian completely blotted out from existence the Aztec of America, to be in his turn extirpated from the earth by the Anglo-Saxon race of mankind.

Immense numbers of the shells of one of the pests of our gardens—the common snail (*Helix aspersa*, MULL.) have been found in some of the graves above mentioned: how often do I wish they were all there! It has been said they are an article of commerce with America, where they are sent in barrels and sold as delicacies. Quantities of a species of *Nerita* have also been found in similar graves. Douglass figures shells of the genus *Cypriæ* in conjunction with burial places, and Mr. C. Roach Smith says specimens of the genus *Nerita* and *Buccinum*, drilled as beads for necklaces, were discovered with remains at Settle, in Yorkshire. And at Sandwich a gold coin and cowry-shell were found in an urn. In the *debris* from the diggings at Colchester, the geological attainments of Mr. Brown, of Stanway, have been most liberally and usefully contributed to the antiquary in that locality, and a little knowledge of natural history will always be found of essential service during these explorations, nor would it be useless in avoiding and detecting imposition. The visitor to Warwick Castle will, amongst other wonders, be indulged with the sight of the rib of the terrible dun-cow slain by the redoubted Guy, but his knowledge of comparitive anatomy will enable him to assign it to the fossil elephant. At Chesterfield Church another rib of this monster cow, no less than seven feet long, is exhibited,

and may be identified with the jaw-bone of a small species of whale. The brown bear (*Ursus arctos*, LINN.) is one of our ancient indigenous animals, and infested some portions of this kingdom almost as late as the sixteenth century. The beaver (*Castor Fiber*, LINN.) was noticed in Wales by Giraldus de Barri, in one thousand one hundred and eighty-eight, and is known to have existed in great abundance at an early period on the banks of the river Hull, in Yorkshire, where the memory of its denizenship is still retained in the name of the town of Beverley—and Cambridgeshire has produced a skull of it in a fossil state. The wolf (*Canis lupus*, LINN.), now happily exterminated, continued to prowl about our homesteads and sheep-folds almost to the eighteenth century. The wild boar (*Sus scrofa*, LINN.) ranged the forests about London in the reign of Henry the Second, and its tusks are rather abundant in or near most Roman encampments. One found at Richborough had an ornamental piece of brass attached to it,



and had probably been worn as a trophy or remembrance of some animal of extraordinary endurance in the chase, or ferocity in fight. Some legs of cocks (*Gallus domesticus*, BRISS.) were found at Bartlow, which might have been preserved from the latter motive. I am not aware that any of our primæval antiquaries have noticed the bones of any of the foregoing in their explorations, except those of the boar. Although the bones of the red deer (*Cervus elaphus*, LINN.), and the roebuck (*Cervus capreolus*, LINN.), are found at various Roman stations, I once saw the greater part of a skeleton of the former which the peat had preserved, taken from the bottom of a ditch which emptied itself into the river at Colchester. From these facts, a fair inference may be drawn that they were once numerous in our woods and forests. The roebuck exists still in small numbers in Dorsetshire, but the red deer has been driven to take refuge in the Highlands of Scotland, which, three hundred years ago, were inhabited by a native buffalo (*Bos Taurus*, LINN.) which since that time has been extinct. It may be interest-

ing to know that an antique Highland drinking horn, which was in the possession of the late Mr. Croker, was of the horn of this animal. In the sister kingdom of Ireland have been found, at various places, preserved in the peat bog of that Island, the skeletons of the Irish elk (*Megaceros Hibernicus*), and in one instance the bones were discovered in combination with weapons of bronze, evidencing that this noble stag, now extinct for many centuries, was coæval with man, and came by its death by his machinations. In several instances it has been found in England, and one of the localities where it has been brought to light is your forest of Hoylake. In that forest you have yet a mine of scientific wealth.

Amongst the osteological remains found in London, Colchester and Hartlip, are the skulls of an entirely extinct ox (*Bos longifrons*); others found at Chesterford, belong to a smaller species which may be referred to that which is now called Alderney. The bone skates of the mediæval times, in the valuable museum of Mr. C. Roach Smith, dug up in Moorfields, probably lost when that locality was a moor, covered in winter with water and frozen over, are said to be the bones of horses; but some smaller

ones that I have seen, are evidently the metatarsal and metacarpal bones of the red deer. I know not what to make of the bronze cow found at Aldborough in Yorkshire, but Mr. Ecroyd Smith amongst the discoveries there, has depicted a well executed head, in bronze also, of the roe-buck, with characteristics sufficient to identify it at once. The interesting museum of Mr. Bateman, of Youlgrave, Derbyshire, contains a musical instrument, in length nine inches; it was blown from the larger end, and has four holes for the fingers, and was found with some urns, close to the Ermyn street at Lincoln, in the year eighteen hundred and twenty four. In the last age it would have been called a flute, but with us it would be a whistle. Several Roman flutes are known; they are chiefly made in short pieces, and must have been cemented together, their fabricators not having mechanical appliances to make them in one piece. I have observed part of one in that admirable museum in Colquitt street, which your

honorary curator Mr. Mayer allows so liberal a use to be made of; there is also another of the same description in the collection of the Cambridge Antiquarian Society, found by the late Mr. Tuskip, of Shefford, at Stanford, in Bedfordshire. These were played, as far as can be judged, as flutes are now, by being held from left to right, the hole by which the wind entered being upon the same plane as those which were stopped by the fingers. In the Disneyan collection at Cambridge, there is an antique statuette of a faun playing upon a flute precisely in the same way; and in the time of our Queen Elizabeth the illuminated works of the day testify that flutes, or perhaps rather fifes, were used in a similar manner, although a century and a half after, flutes of this description were unknown in this kingdom, the only one in use in Handel's day being nothing more than a monster whistle, played from the end. The instrument as at present known has since been introduced from Germany. So far the Lincoln instrument is of value to the archæologist; to the naturalist it is interesting from the circumstance of its being made of the *tibia* or thigh bone of a British bird, though now extinct, (as far as Britain goes,) the crane (*Grus cinerea*, BECKS.), which in the time of Ray the naturalist, who wrote in 1611, was plentiful throughout England. Civilization has completely extirpated it, and the last straggling specimens upon record were taken in 1831. This part of the subject might be prolonged to an indefinite length, but enough has been said for my purpose.

But little I fear can be brought to light, of the knowledge of natural history during the dark ages which intervened between the exodus of the Romans, anno domini 428, and the advent of William the first in the year 1066, yet it may be interesting to know that our Saxon forefathers were not unmindful of it. A sculptured tomb-stone forming part of the foundations of the old Church of St. Dennis, at York, of this latter period, exhibited some rude representations of animals and men. One of these is clearly Romulus and Remus receiving nutriment from the dugs of a wolf, and in Bakewell church-yard, which has been elucidated in Mr. Bateman's "Vestiges," another of these roof-shaped coffin-lids or tombs has been discovered, displaying a bull and an elephant fighting, and at the end of this same tomb are two animals more like Llamas, (*Llama pacos*, LESS.), than anything else, but it cannot be supposed that this South-American quadruped could be known in this hemisphere. They have been called Griffins,

but were probably intended for Giraffes, *(Camelopardalis Giraffe,* GMEL.*)*, and it is a curious matter for speculation to reflect on, whether our Pagan ancestors had really any knowledge of the elephant or giraffe, or whether they yielded to the force of imitation and copied from existing Roman works, as both these animals were known to that people through their African colonies. In the case of the York tomb, the latter seems to be a certain conclusion to come to, the wolf with Romulus and Remus having with great probability, been copied from the coin which was, and is so plentiful from Constantine downwards. In the rude composition of the Bakewell elephant and bull-fight tomb, there is so much of the same character as one of the subjects on a tessellated-floor, of the temple of Diana discovered at Rome, that I have come to the same conclusion; and Giraffes are depicted on the Roman mosaic floor at Prœneste, before alluded to. The round form of the upper part of the head of the elephant in the floor of the temple of Diana at Rome, and its very large ears, are characteristics sufficient to indicate that it is the African *(Elephus Africanus,* BLEUM,*)* not the Asiatic or Indian *(Elephus Indicus,* CUV.*)* elephant to which latter class all the animals now introduced belong. No living African elephant has ever been known in Europe, and the only mounted skeleton and skin, is in the museum of Saffron Walden. The African are said to be more intractable, yet it is nearly certain all the elephants used by the Romans belonged to this species.

The antiquary in visiting those very interesting relics which have escaped the ravages of time and spoliation, the tessellated pavements of the Romans may bring his natural history into play in various ways. At Woodchester, Frampton, Cirencester, and other places, the animals are depicted with tolerable accuracy, and those apartments which are called rooms of the seasons, from the emblematical busts at the four corners of the floor, will not fail to attract attention, each bust displaying its peculiar attribute; Spring, with its sprig of flowers in the bud, and at Cirencester, a swallow, the harbinger of spring, sitting upon its shoulder; then Summer, with its full blown flowers; and Autumn, with its fruit and ripened ears of corn; and lastly comes Winter, with its hood and leafless branch. On the floor of Præneste before alluded to, the hippopotamus, rhinocerous, giraffe, crocodile, and many others, have character enough about them to be assigned to their proper places.

Understanding that there was a Roman villa preserved at Northleigh in Oxfordshire, I was induced to visit that locality, expecting to see it carefully preserved, and was rather disappointed, that with the exception of one room, which had been covered in, it is in so ruinous a condition. Still it was highly worthy of a visit, and would well repay the careful attention of the antiquary. It stands in a delightful valley, and the day of visiting was fine, and all was gay with the flora of the country:

> "Ye field flowers, the gardens eclipse you 'tis true,
> Yet, wildlings of nature, I dote upon you:"

and ample amusement presented itself. I found, to my surprise, crawling about the ruins in tolerable abundance, the large white snail (*Helix pomatia*, LINN.), the cottager who lives on the spot told me they were very destructive to his garden, often clearing off his crop of young vegetables, but were never found half a mile distant from the villa. There they were confined entirely to this warm secluded valley. There is a colony of them at Newton, in Cambridgeshire, though history is silent as to this ever having been a station of that people, or that a Roman-road ever ran near. The finding of their coins however, and the remains of a considerable fosse, suficiently indicate that it was once in their occupation. My friend, Mr. R. Headley, tells me that he has transferred many of these snails to his garden at Stapleford, a most salubrious spot, but has failed to perpetuate them, and also to a warm situation at Babraham, with a like result. This helix is said to be found in some of our southern

counties, and I once picked up some dead shells of this species on one of the Sussex downs, not very far from Bignor, where several of the beautiful mosaic pavements still remain, though now threatened with destruction. It is said also to be found near some other Roman stations in England, and Mr. C. Roach Smith tells me he has a shell of one found with Roman remains. They were undoubtedly introduced from Italy by the Romans during their residence in this country, and are as we see still found lingering in the localities which were occupied by that people. They were fattened by them in pits as luxuries for the table, from which circumstance they were named by Dr. Leach 'pomatia antiquorum,' and by De Costa 'cochlea pomatia,' from their being picked from their shells by an implement called cochlea; and we learn that they were served up at a feast of Nero's, first fried and then grilled on silver. Nine of these animals I transferred alive to my plant box, and transported them to the northern corner of Essex, deposited them in a well walled-in garden of a friend, who was nothing loth, in a warm situation. There their habits were well watched, they deposited their eggs almost as soon as they arrived, but no young could ever be discovered, and they lingered until the fourth year, when the last of them died; thus proving their incapacity to increase, or to exist for any length of time, in higher latitudes or an unpropitious spot, and proving also the wisdom of the Romans in the selection of the sites for their residences. Dr. Lister, an able antiquary as well as naturalist, who wrote in sixteen hundred and seventy eight, says they were eaten in this kingdom in his day, boiled in spring water, and served with oil, salt, and pepper, and made a dainty dish; and to such a dish as this, in his "Every man in his own humour," Ben Jonson evidently alludes in the lines,

"neither have I
Dress'd snails or mushrooms curiously before you."

I fear it would be too dainty a dish for our stomachs now, though I believe in the northern parts of this kingdom snail feasts are still held once a year.

A small bronze branch or sprig, of the Roman period, in the interesting collection of national antiquities belonging to Mr. C. Roach Smith, though rude, has characteristics enough about it to determine the genus to which it belongs. The cones upon it, their shape, the fascicolated leaves (in

bundles), at once indicate that it was intended to represent a branch of fir. Its owner says, it may probably have been an accessary to a statuette. The fir-tree or pine was sacred to Cybele and Pan among the Romans, as the cone was, in some not very proper way to Venus among the Assyrians. The cones were also sacrificed to Esculapius, being considered by the Romans as a remedy for a cough, and were thought excellent against asthma; as they were also to Bacchus, from their being thrown into their vats to give pungency to their wines. The astringent flavour thus given was agreeable to their palates; and the custom is practised to this day in Italy. It is well known that the beverage called spruce-beer now in Britain, is flavoured with the twigs and cones of the spruce-fir, (*Pinus excelsa*, WALL.) The thyrsus of Bacchus, too, is generally terminated by a pine-cone. It is not unlikely, therefore, that this pine-sprig may have once occupied the hand, or otherwise formed an adjunct to this latter deity. The kernels of the stone pine (*Pinus Pinea*, LINN.), a species very common in Italy, are soft and of an agreeable flavour, and are used at the present day as a dessert; they have been found in the pantries and amongst the domestic stores at Herculaneum and Pompeii.

The Egyptian antiquary may admire the graceful and correct drawing of the Ibis (*Ibis religiosa*) on the monuments and tombs of that ancient people, and meditate over the species of plant that produced the papyrus, and look with curious eye on the beetle (*Scarabeus sacer*) which is so frequently mixed up with their worship, a species very numerous in Egypt, and probably made an object of worship from excessive industry, and the great

care it takes of its young; as also those other species of beetle, and their larvæ which have been found in the heads of mummies, and from their number they produce quite a field for the entomologist which forms a most interesting and puzzling inquiry for the student in that science. As many as half a score species of beetles and their larvæ, and pupæ of dipterous (two-winged) insects have been discovered at different times in the heads of mummies. Nearly three hundred specimens of the *Dermestes pollinctus* of Hope were found in one skull; but few of them can be identified with species now living. The different stages of development in which these insects are found, prove either that the system pursued was a very slow one, or that the body was much neglected before it underwent the process of embalming, as after the asphaltum was once injected, and the air excluded by bitumen and bandages, it would be next to impossible for animal life to exist. The naturalist antiquary may further amuse himself with mummies of the cat, crocodile, as well as those of his own species, in their gorgeous cases, which have been torn from their magnificent tombs. "Man is a noble animal; glorious in ashes, pompous in the grave." Or he may trouble himself on the vexed question as to whether a grain of wheat or a tulip-root will retain its vitality two or three thousand years; and he may learn from their bread which has come down to us, that it was from a coarse wheat, coarsely ground, and was made into loaves, without any of the bran being extracted. The Ethnologist who seems destined to draw in closer bonds the two studies, can always find an abundant field for the pursuit and exercise of both. Lord Carlisle in his recent work, supplies me with a case in point, he says, the figures of the Dacians on Trajan's pillar, are said to resemble the modern Wallachians, in feature, person, and costume, and with the help of a little Latin, and a little practice, their language might soon be made out, and in one of the narrow gorges of the Danube just below Moldova, the inscription cut in the rock to commemorate Trajan's Dacian campaign is still legible. If he should stray so far while studying the natural characteristics of the Wallachians, his zeal will lead him to survey the wall thrown by that emperor across the isthmus, and at the same time look after the fauna and flora of that region, he will be rendering an important service both to archæology and natural-history. Without doubt Liverpool has several men conversant with both, as well as many eminent men of other sciences who reflect great credit upon their

town, and doubtless the Historic Society will bring out much latent talent. To them these hints will be quite unnecessary. You have one of by-gone days, your poet-historian, Roscoe, to whom all honour is due, and you may be justly proud of another native of Liverpool, Swainson, who although now inhabiting a distant region, stands very prominently forward as a most accomplished naturalist and author.

I will now conclude with a verse of Campbell's, on the wild flowers, which beautifully shadows forth that combination of sciences for which I am contending, and had I thought of it sooner it might have served me for a motto :—

> "Not a pastoral song has a pleasanter tune
> Than ye speak to my heart, little wildlings of June,
> Of old ruin'd castles you tell—
> Where I thought it delightful your beauties to find
> When the magic of nature just breath'd on the mind
> And your blossoms were part of her spell."

On the Results of the Self-registering Tide Gauge.

By Lieutenant W. Lord, R.N.

(Read 26th April, 1855.)

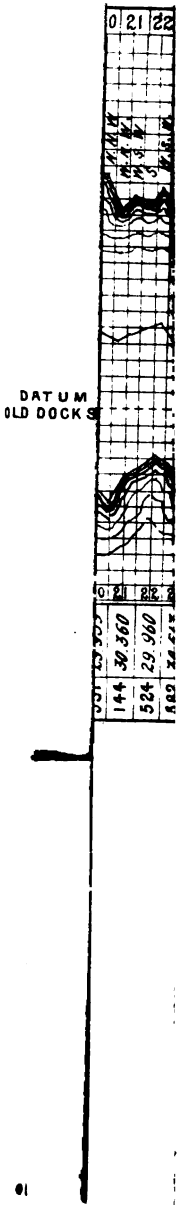
It is not generally known that Liverpool, notwithstanding its importance, has possessed a self-registering tide gauge for little more than twelve months, while other ports of far inferior importance have been able to boast its possession for many years. There are two of these connected with what is officially termed "the port of Liverpool," both of which were constructed by the dock surveyor in the close of the year 1853. One is at Hilbre Island, the eastern entrance of the river Dee, and the other at St. George's Dock, Liverpool. They were intended to commence operations on the first of January, 1854, but practically it was about the 15th of the month. The machinery, which is by Newman, of Regent street, London, consists of a cylinder or "drum" connected with a clock. The cylinder carries round with it in its revolutions a prepared sheet of paper, on which hours are marked in one direction and feet in the direction at right angles to it in dark lines. Each of these is subdivided by fainter lines into more minute spaces, representing respectively quarters of hours and three-inch spaces. The large landing stage at the George's pier forms the float,

and is connected with the machinery of the gauge; and at Hilbre Island a copper float rises and falls in a well, which always exhibits the sea level, being connected with the tide by a syphon. A pencil, connected with the float, works horizontally on the surface of the paper, the cylinder making an entire revolution with it in twenty-four hours.

Four large and beautiful diagrams now laid upon the table, each exhibit the diurnal rise and fall of the tide for a period of six months. Two of them show the working of the gauge for the whole year at St. George's pier, and the other two give the same results for Hilbre Island. The difference shown at two points so adjacent to each other, and so thoroughly subject to the same general influences, is such as not to call for any special remark. The former tables, however, have annexed to them a daily registry of the direction and force of the wind, and the height of the barometer also; for the whole of the year 1854. These facts have been furnished by Mr. Hartnup, from the observations made at the Liverpool Observatory; and they are of great importance in ascertaining how far the ordinary tidal changes are influenced by the wind and atmospheric pressure. The marine surveyor has also been at great pains in making out monthly tables, showing the difference between the calculated and actual times and heights of high water. The former were obtained from Holden's tide tables, the latter were furnished by the gauge at George's pier. These will, in the course of a few years, form a body of most valuable data, from which important general conclusions may be drawn.

In the year 1854 there were 231 tides plus, 112 minus, and 22 agreeing exactly with Holden's tide table. The greatest rise of water was February 28th, when it reached the height of 20 feet 2 inches above the old dock sill, or 30 feet 7 inches in all. The reasons were, that it was a spring tide, the wind was W.N.W., and it was blowing strong at the time. The least rise of water was on October 15th, when the range of tide was only 7 feet 9 inches from high to low water. This was a neap tide; the wind was N.W., and it was blowing gently.

The greatest difference between the tide gauge and Holden's tables was two feet eight inches plus, occurring on the 17th of February. The tidal curve presents a remarkable variation on that occasion, the wind being near its greatest force, or with a horizontal motion of 965, and the barometer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144 30 360
524 29 960

being 29.442. The smallest difference between the gauge and the tables was two feet six inches minus, the wind being then S.S.W. and W., with a horizontal motion of 338, and the barometer being 30.279.

The barometer stood at its maximum, 30.587, on the 12th of October; and at its minimum, 28.762, on the 7th of January.

The horizontal motion of the wind was the greatest on the 18th of February, when it reached 1039 miles, or 43¼ miles an hour. Its direction was N.W., and the barometer 29.774. The horizontal motion was least on the 12th of February, when it was 89 miles, or 3¾ miles per hour. The direction was then N. and E., and the barometer 30.323.

[The Council of the Society, have obtained the permission of the Dock Committee, to publish the Liverpool Tidal Chart in their Volume.]

On the Lepidopterous Insects of the District around Liverpool, with some of the causes of the Abundance or Scarcity of Insects.

By Charles Stuart Gregson.

(Read March 15th, 1855.)

In entering upon this subject, I beg to remark that I have confined myself to a distance of ten or at most twelve miles from the Exchange. In doing so, I shall be compelled to omit many species which are unfortunately recorded as belonging to this district in Byerley's "Fauna of Liverpool," but which have never been taken within from twenty-three to thirty-five miles of Liverpool. I have also omitted several species which are stated to be "plentiful everywhere," "taken at New Brighton," "beyond New Ferry," &c., &c., but which have never been taken in the North of England. As a set-off against this seeming reduction in our "Fauna," I am able to add many species, especially scarce ones, to our list, and also to assign localities within the district to many species for which the Fauna would send us twenty or thirty miles.

In preparing the list which accompanies this paper, I have only one object in view, viz., to give as correct information as I possibly can respecting every species which I have taken myself, or which I have known other

persons to have met with. For I hold that all works on natural history should speak only of well-ascertained facts.

I feel that I have a dry subject to treat upon, and shall therefore endeavour to be as brief as possible.

Without entering into a description of the district, (which is well known to the members of the Historic Society), I may say I consider that ten or at most twelve miles is as far as we can possibly go for natural history purposes, without interfering with the districts which properly belong to our neighbours. I can refer with certainty to every species in the list as having been taken within the limits which I have named, except one species which is only named to induce those who have opportunity to try to find it within our bounds, it having been found a very short distance without the limits.

We have in Britain sixty-five species of butterflies, and my list contains thirty-five species, or about sixty per cent. of those found in England.

Of moths we have *Sphingidæ*, fourteen species against thirty-four species in Britain, which is a great proportion, when we take into consideration the fact that the genus "*Trochilium*" has nine species in it, only one of which has been taken in this district. Of "*Bombycidæ*" we have forty-six species against ninety-three in the British list, and in *Noctuidæ*, or true night-flying moths, we have 173 against 295 species recorded as British. This shows a result unexpected by the most sanguine, and proves that the district is very rich, and has been well worked up, though of course it is not exhausted. Of *Pyralidæ* we have about twenty-six species against sixty-three, a greater proportion than might be expected, as many of this family are confined to mountains, limestone, and chalk districts. In *Crambidæ*, a group belonging to the *Pyralidæ*, we have about thirty against about seventy species, and in *Geometradæ* we have about 147 species against 263, again about fifty per cent. Of *Tortricidæ* we have about 140 species against about 280, or fifty per cent of those in Doubleday's Catalogue.

I am now working upon the "*Teneidæ*," and hope shortly to produce a list of them, which will be useful to all who follow me in the study of this difficult section of Lepidoptera.

It is a common saying, that "where birds frequent there are insects," and this is correct as far as it goes. But an entomologist on finding a locality where birds are scarce, or where they only come to breed, or where

they are destroyed by foolish farmers as fast as they come, says, this is the place for insects, and straightway fits up his net, and daubs his sugar on the trees.

Cheshire is a very heaven for an entomologist. The birds are destroyed without mercy. Sparrows are scarce in many villages, so the insects ravage the crops, when they themselves ought to have filled the crops of the birds. The sparrows, chaffinches, greenfinches, and bullfinches are hunted down, and all but exterminated; even the beautiful blue tit, perhaps the most useful bird we have in a garden, is shot in Cheshire by men who do not know their friends. They see him hanging and peeping into every crevice; around every twig he goes, and every time he bores into a bud he brings out an egg, a larva, or a pupa, and is punished, nay destroyed, whilst doing his best to destroy the vermin which nature gives for his food.

I have visited several villages in this district where sparrow heads are paid for by foolish overseers, and have invariably found farmers grumbling about "t'blight it' apples," "crumbled plumbs," "cherry trees wi'out leeaves," "blotched pears," &c., and blaming all sorts of thunder-storms, close or sultry days, bewitched trees, &c., but never once blaming themselves for destroying the things sent by nature to prevent the fruits of the earth from being eaten up.

I have visited land infested with cockchaffers' larvæ, and have heard men who ought to know better, say, that "between th' crows and th' grubs th' crops 'er spoilt," and priding themselves that they have at last got rid of one of "th' varmin—th' crows." I have seen patches of turnips, half an acre each, with one or more grubs in every plant, and have seen the crows and starlings shot down or chased away from places not yet much injured, when, if let alone, they would have cured the disorder as they devoured the larvæ, and the week following have heard that "th' corner where them there crows wad goo' hes clean gone, every turmit rotten."

I have spent much time trying to convince my prejudiced friends that the crows and other birds were their best friends, that they were the enemy nature had sent to eat up and destroy the grubs and insects, that one crow did more good than two men could do, and that one sparrow destroyed more larva in one day than several men could.

To convince a farmer that sparrows are useful and valuable to him in

the face of his pease rooted up, is not easy; but to convince him that chaffinches and bullfinches are prizable on his estate, whilst the buds and blossoms of his cherry and gooseberry trees are strewed on the ground, is a much more difficult task; and to convince him that crows are worth paying for on his land, with the fact that sundry potatoes which he has lately planted are rooted up before his eyes, is a Herculean task, especially when we take into consideration his antecedents, and when we consider how he loves to do as his "fayther" and his "gronfayther" did before him. Yet this is the task which the entomologist who loves his neighbour has to undertake and carry out. To shew the agriculturist that in consideration of about four or five weeks' food, half in spring and half when the crops are ripe for the sickle, his feathered friends will keep down the natural enemies of his crops, and ensure him an average return. To shew him that every bird on his estate is money in his pocket, is a difficult undertaking, but is nevertheless the fact.

The most I can get the farmers to grant is that robins and throstles are innocent things because they dont eat corn, they will not admit that they are useful, but being innocent they let them live.

I will now give you the food of these birds, in order to shew how useful they are to the agriculturist, and how destructive to the food of the entomologist's cabinet.

In winter the granivorous birds feed upon the seeds of grass and weeds of every description, thus saving the farmer much labour; they also obtain berries and other wild fruits, and a few stray grains of corn around stacks and barn doors.

In spring they obtain food from buds and young shoots of trees and shrubs, and sometimes get a good breakfast of pea, turnip, or cabbage seed, with mustard or cress as condiment, and shortly afterwards have a young brood to provide with soft food, and the larvæ, now just beginning to ravage the trees and grasses, supply them with the food they want, and without which the young cannot live.

"See that sparrow i'th apple tree," says the farmer, "he's biting 'th bud off." Look at the bud: it is a crooked gnarled thing, with a small hole in it—*empty!* Look at the next bud; in it you find a small grub eating the very centre of the shoot, and thus stopping all growth. This is

argyrosstia curvella, a lepidopterous insect belonging to a genus, which soon puts a stop to the healthy growth of fruit and forest trees, and shrubs, where birds are scarce.

See that chaffinch on the white or black thorn, he is now on the plumb tree. Watch him how he hunts about; he is after this genus; his food seems scarce. Oh! he is on th' flower bed. See how he pulls that bonnie white rocket. Ah! ah! ah! he has got a larva, that is *Plutella porectella*, LIN., a species which entirely prevents the growth of this beautiful flower in many localities.

Listen to the chatter in the cherry tree. See how the leaves are pulled asunder, and away goes the larva of *Penthina cynosbana*, LINN., which, if left, would defoliate the tree.

In summer the same sort of food, with a few ripe seeds, satisfies them; and in autumn, when the grain is ripe and the trees overburthened with a glorious crop, surely a few grains may be spared for such good friends before it is housed.

If you look at rooks, starlings, and thrushes, open the crop of each, and you will find that none but an entomologist has any right, on any pretence whatever, to destroy one.

Let us now take the food of the small soft-billed birds, and we shall see that destructive as the hard-billed birds are amongst weed seed and larvæ, the soft-billed birds play a most important part amongst the "aphideæ" and "Ichneumonideæ." Without them in many seasons our fruit trees would be so choked up with what is generally called blight and honey dew, that they would be unable to take the benefit of the night or morning dew, and so could not ripen any fruit. It is true a shower of rain clears all the aphides away, but showers of rain do not come every day in dry seasons. And then we have the whole family of ichneumons to be kept down by the soft-billed birds—if they were not checked the hard-billed birds would be short of food for their young The ichneumonideæ are principally bred and fattened upon lepidopterous larva, so that, without a check upon them, lepidoptera would soon become things that were; but nature, in its infinite wisdom, has provided the check which man, in his ignorance, shoots down, or at most lets live because he thinks it innocent.

When birds are scarce from want of shelter, as upon the sand hills of

our coast, lepidoptera abound; but even here nature sends a check upon them and upon the ichneumonideæ, the ground builders breed and find food for their young on these sterile wastes. Skylarks, tit-larks, and cuckoos are in profusion during summer, and finches breed all around the waste—and though finches are true seed feeders, they make their young fat, and sing upon insects alone, until their proper food (seed) is ripe.

In open springs when the ichneumons are called to life early by the warmth of the sun, lepidopterous larvæ suffer severely, and our summer campaigns must be confined to districts where the birds are not destroyed, or our journeys will be bootless.

Late springs are decidedly the best for the lepidopterologist, for as early springs bring the ichneumons to life before the summer birds come, so late springs keep them back until their enemies are here and on the look-out for them. But supposing the birds to be late, nature provides another check upon them by sending us a few nights' frost, which, without injuring the lepidopterous larva, entirely destroys the hymenopterous and dipterous insects which have perfected themselves. It is when the trees and shrubs are cut up with east winds in spring that the lepidopterist may expect a bad season—the food of the larva being destroyed, the insect dies.

These, then, are some of the causes of the abundance or scarcity of insects. That there are other causes no one can dispute, but as the book of nature is open to all, I leave it to the perusal of all, feeling convinced that whoever reads a page in it will wish to finish the chapter.

Class INSECTA.

Order LEPIDOPTERA.

Section 3. HETEROCERA.

BOMBYCIFORMES.

(NOCTUÆ LINN.)

FAMILY 1.

NOCTUA BOMBYCIDIÆ Bdv.

Genus THYATYRA Och.

GROUP 1.

T. derasa, Linn.—Plentiful at sugar in Bidston pleasure grounds, and at Hale. Sparingly at Birchwood, and the Dingle. July.

GROUP 2.

T. batis, Linn.—Not scarce at Bromborough, in a wood near Spittal Station, and plentiful at Hale. A few may be got in the plantations at Wallasey. June. Sugar.

Genus CYMOTOPHORA Tr.

GROUP 1.

C. duplaris, Linn.—Between Roby and Huyton Quarry, and in Cheshire where Alders grow. End of May.

C. diluta, W.V.—Abundant at Hale in the Oak Woods. I have taken a few around Eastham. August. Sugar.

C. flavicornis, Esp.—First taken by Benjamin Cooke at Eastham, since then has been taken all round the district. Mr. Almond takes it at Light. April.

C. ridens, Fab.—I have only seen one specimen of this splendid species taken in this district. It was taken in the Boor's Wood, Hale, by Frederick Hitchmough. April.

FAMILY 2.

BRYOPHILIDÆ Gn.

Genus BRYOPHILA Tr.

B. perla, W.V.—Common under coping stones in August.

FAMILY 3.

BOMBYCOIDÆ Bdv.

Genus DIPTHERA Och.

D. Orion, Sepp.—Two specimens of this species were taken near Hooton some years ago, by Mr. Harris. Should come to sugar in May.

Genus ACRONYCTA Och.

A. tridens ? Ræs. Psi, Lin.—Abundant everywhere.

A. leporina, Lin.—Larva beaten from young birches at Simonswood Moss. Birchwood and Bidston in September and October. Perfect insect at sugar in May.

The typical leporina is bred from a Canary coloured larva, and the variety (?) Bradyporina of Trietch is bred from a *greenish straw coloured caterpillar.*

GROUP 4.

A. megacephala, De G.—Comes freely to sugar where white Poplars grow. May.

GROUP 5.

A. Alni., Lin.—I have seen three larvæ of this species, and one perfect insect come to sugar in June, 1850, at Speke Hall.

A. Ligustri, De G.—A scarce insect at sugar in May. Speke, Hale and Rainhill.

GROUP 6.

A. Rumicis, Lin.—Abundant on Sugar in May.
A. Salicis, Curtis.—I have this year taken a specimen of Salices. I found it on a stone wall at Bidston.
A. Menyanthidis, Esp.—Not uncommon on the Mosses. June. Found on the Heath, and males taken with a female at dusk.

Section 4.—GENUINÆ.

FAMILY 1.

LEUCANIDÆ Gn.

Genus LEUCANIA Och.

GROUP 1.

L. conigera, W.V.—On Ragwort flowers at New Brighton and Dacre Park. Mr. Almond.

GROUP 2.

L. Lithargyria, Esp.—Abundant near the Coast on sugar. June and July.

GROUP 3.

L. obsoleta.—My friend Thomas Townley used to take this species freely on Bidston Marsh. End of June. I have only met with a few of it at rest on reeds, about 11 o'clock, p.m.
L. littoralis, Curtis.—Plentiful on the sand hills in July and August, *comes to sugar*.
L. pudorina, W.V.—First taken by T. Townley and G. Crozier. We were crossing Bidston Marsh to shelter from a storm, when we found them creeping out of the wet reeds and grass; took pity on them and sheltered them in our collecting boxes. End of July.
L. Comma, Lin.—Abundant. Sugar in June.
L. Straminea, Tr.—I have specimens taken by myself from flowers growing in ditches between Leasowe Lighthouse and the Meols. They fly late. Also taken by T. Townley.
L. impura, Albin.—Plentiful on thistle and rush flowers at dusk in July.
L. pallens, Lin.—May be taken in company with Impura.

Genus NONAGRIA Och.

GROUP 1.

N. fulva, Hub.—Plentiful on mosses and swamps. Comes to light freely.

GROUP 2.

N. Typhæ, Naturf.—Plentiful where Typhæ latifolia and T. augustifolia grow. Pupa in the stems of these plants in August.
N. lutosa, Hub.—Plentiful upon Bidston Marsh. At rest on reeds, &c., at night. September and October.

FAMILY 3.

APAMIDÆ Gn.

First division of Family. (Gortynides.)

Genus GORTYNA Och.

G. flavago, W.V.—Pupa may be taken from the stems of thistles and rag-weed, in August and September. Cut close to the root. Comes to light in September.

Genus HYDROECIA Gn.

GROUP 1.

H. Nictitans, Lin.—Plentiful at Simonswood Moss. A few specimens may be got on flowers around New Brighton, in September.

GROUP 3.

H. Petasitis, Doub.—I have this year found the larva within our district. Feeds on the roots of Petasitis vulgaris.

H. micacea, Esp.—Plentiful at gas lamps.

Second division of Family (Xylophasides.)

Genus AXYLIA Hu.

A. putris, Lin.—Common in lanes. June and July.

Genus XYLOPHASIA Steph.

X. rurea, Fab.—Plentiful everywhere. Variety combusta on sugar at Wallasey. June.

X. lithoxylæa, W.V.—In profusion in June and July. Sugar.

X. sublustris, Esp.—The Boorswood, Hale, is the only locality I know for this species in this district. Sugar early in July.

X. polyodon, Lin.—Everywhere in summer on sugar.

X. Hepatica, Lin.—Near Hargrave Hall at Hale and Croxteth. On sugar in July. Not plentiful.

Genus NEURIA Gn.

N. Saponariæ, De G.—A single specimen taken by myself between Rainhill and Ditton, in July. Sugar.

Third division of Family (Episemides.)

Genus HELIOPHOBUS Bdv.

H. Popularis, Fab.—Comes freely to light. Near old grass lands, in August and September.

Genus CHARÆUS St.

C. Graminis, Lin.—May be taken as popularis is, from June to August.

Fourth division of Family (True Apemides.)

Genus CERIGO St.

C. Cytherea.—Plentiful at sugar all round the coast. July.

Genus LUPERINA Bdv.

L. testacea, W. V.—Abundant on gas lamp in August and September.
L. cespites, W.V.—Wallasey sand hills and Crosby Warren, at light. August to September.

Genus MAMESTRA Och.

GROUP 2.

M. abjecta, Hb.—This is a scarce species here. Mr. Almond has taken three specimens at sugar in Cheshire. July, early in August.
M. anceps, Hb.—Not uncommon at sugar in the plantations at Wallasey. June.
M. albicolen, Scpp.—Freely under banks on the sand hills in June.
M. Brassicæ, Lin.—Abundant.
M. Persicaræ, Lin.—Larva on Clematis in gardens. October.

Genus APAMEA Och.

GROUP 1.

A. basilinea, W.V.—Very abundant. May and June.
A. gemina, Hub.—Gardens and old lanes. May, June and July. Sugar.
A. unanimes, Hub. ?—Pupa at the foot of moss grown trees. Hale, Prenton, and Croxteth. Sugar in July.
A. oculea, Lin.—Abundant.

Genus MIANA St.

M. strigilis, Lin.—Plentiful on sugar in July and August.
M. fasciuncula, How.—In profusion on the coast. July and August. Flowers and at Sugar.
M. furuncula, W.V. —Plentiful near old grass lands. Sugar. July.
M. arcuosa, How.—Halewood, Bidston Marsh, and in moist meadows at Altcar. Sitting on long grass. June.

Genus CELÆNA Steph.

C. Howarthii, Curt.—Plentiful on wet parts of Simonswood Moss. Flies at dusk. August.

FAMILY 4.

CARADRINIDÆ Bdv.

Genus GRAMESIA Steph.

G. trilinea, W.V.—Plentiful around the coast. Sugar. May and June.

Genus CARADRINA Och.

GROUP 2.

C. Morpheus, Nat.—May be taken on the coast in June and July at Sugar.
C. Alsines, Bork. Taken amongst "Blanda," which it resembles. It has hitherto been overlooked, and is new to the British list.
C. blanda, W.V.—Comes freely to sugar in July and August in plantations at Wallasey. Its larva comes to sugar in spring.

GROUP 3.

C. cubicularis, W.V.—In profusion everywhere.

FAMILY 5.

NOCTUIDÆ.

Genus RUSINA St.

R. tenebrosa, Hb. Birchwood is the best locality for this species. June and July. Sugar.

Genus AGROTIS Och.

GROUP 1.

A. valligera, W.V.—Plentiful at New Brighton.

A. annexa, Tr.—I obtained a single specimen of this species from a well-sinker, who took it in his own window or the sandhills at light, some years ago, it is now in Mr. Edleston's collection.

It is said to be an American species. Let our collectors keep a sharp look out for small dull suffusa (?) annexa.

A. suffusa, W.V.—Plentiful on sugar in September and on sallows in spring.

GROUP 2.

A. saucia, Engr.—This species has been taken by Mr. Robson in October, and Mr. Almond in September; and I took one June 20, 1853, at Wallasey.

GROUP 4.

A. segetum, W.V.—In profusion on the coast in June and July under dead leaves and grass, and on sugar.

A. Lunigera, Steph.—I have only seen one of this splendid species taken in this district, it is in the hands of a non-collector.

A. exclamationis, Lin.—Plentiful. Sugar. June, July and August.

A. corticea, W.V.—Abundant at Sugar. Crosby and Wallasey. July and August.

A. ———— ?—A new species in my collection. From Crosby.

GROUP 5.

A. Rapæ, Hub.—I have seen a specimen of Rapæ taken near Runcorn, but as I cannot extend our district to take everything in I see, I merely note this that our practical men may look after this valuable species.

A. cursoria, Naturt.—In profusion on the sand-hills, under dead leaves, &c.

A. nigricans ? Lin. *Fumosa*, W.V.—I breed this insect from the larva. I take at sugar around the moss, and take the perfect insect on flowers in August and September.

A. Tritici, Lin.—Plentiful on the sand hills in August.

A. Aquilina, W.V.—Is scarce here, I take it at Litherland and Maghull in July on flowers.

A. obelisca? Obeliscoides? Gn. Hub.—This species has been taken here amongst Tritici and overlooked. I have taken it at Stourton and seen it taken at Crosby. Flowers. August. Mr. Greening took one near New Brighton.

GROUP 7.

A. Agathina, Dup.—May be taken on the wing at Simonswood moss. Dusk. One specimen taken by M. Almond on the coast. Aug. 1854.

A. porphyrea, W.V.—Plentiful where heath grows. On the wing. Evening.

A. præcox, Lin.—May be taken freely at Crosby and Wallasey under overhanging banks and dead herbage.

A. pyrophila, W.V.—I do not yet know the proper way to find this species. I have taken a few on flowers and at light. July and August. Bidston and Old Swan.

Genus TRIPHÆNA Och.

T. Janthina, Geoff.—Plentiful around Garston. Seems fond of hiding in holly bushes. July.

T. fimbria, Lin.—Larvæ plentiful between Wallasey and Leasowe in March and April. Comes sparingly to sugar in July.

T. interjecta, Hb.—Not scarce on rag-wort flowers at New Brighton in August, about 11 p.m.

T. Orbona, Nat.—In profusion.

T. pronuba, Albin.—Abounds.

Genus NOCTUA Lin.

GROUP 1.

N. glareosa, Esp.—Stourton and Woolton. Found sitting on long grass with a lamp at night. September.

GROUP 2.

N. augur, Fab.—On sugar all summer.

GROUP 3.

N. plecta, Lin.—Abundant amongst blackberry bushes.

GROUP 4.

N. C. nigrum.—Abundant all summer.

N. triangulum, Hufn.—Not an abundant species here. Ragwort flowers have produced a few and some have been bred from larvæ taken at Old Swan, by Mr. Harrison.

N. rhomboidea, Tr.—One specimen taken between Linacre and Bootle on the wing is all I have seen of this species.

N. brunea, W.V —Not common in this district. Larva comes to sugar in spring at Wallasey occasionally.

N. festiva, W.V.—Abundant at sugar in old lanes. July and August.

N. Dahlii, Hb.—Hargreave Hall and at Hooton in September, on sugar.

N. bella, Bork.—Plentiful upon flowers and at sugar in summer.

N. umbrosa, Hb.—On the coast on flowers and at sugar. August.

N. Baja, W.V.—Abundant everywhere.
N. neglecta, Hb.—Only two specimens have been taken, one by Mr. Nixon at Hale, one at Hut of Huts Wood. August. Sugar.
N. xanthographa, W.V.—The most abundant Noctua we have.

FAMILY 6.

ORTHOSIDE Gn.

Genus TRACHEA Och.

T. pineperda, Natu.—May be taken where Scotch firs grow, by beating; and comes to sugar April and May.

Genus TŒNEOCAMPHA Gn.

GROUP 1.

T. gothica, Lin.—May be taken freely by shaking stone fruit trees when in bloom, after dark.

GROUP 2.

T. rubricosa, Rœs.—Plentiful upon sallow blossom.

GROUP 3.

T. instabilis, Rœs.—On sallows in bloom.
T. opima, Eng.—On sallow bloom on the coast. Crosby is the best place for this species.
T. Populeti, Fab.—On sallows about Eastham, Hale and Lydiate. April.
T. stabilis, Albin.—Plentiful near oak woods. March and April. Sugar.
T. gracilis, W.V.—Not scarce. On the small sallows which grow on the sand hills. March and April.
T. munda, W.V.—A few may be got in the woods at Hale, Croxteth and Hooton. Sugar and on sallows. April.
T. cruda, W.V.—In profusion where munda is got.

Genus ORTHOSIA Och.

GROUP 1.

O. suspecta, Hub.—This species seems scarce here. I have taken it at sugar, between Stourton and Hargreave Hall. End of July.

GROUP 3.

O. Ypsilon, W.V.—Wallasey plantations. July. Sugar.

GROUP 4.

O. Lota, Lin.—Plentiful on sugar anywhere. August and September.
O. Macilenta, Hb.—Not plentiful. Hooton and Birch Wood are the best localities for it. Sugar. August and September.

Genus ANCHOCELIS Gn.

A. rufina, Lin.—Freely at Stourton and Hale. A few at Bidston. Sugar. September.
A. Pistacina, W.V.—Abundant at light and sugar, and is as variable as it is numerous.

A. lunosa, Haw.—Freely at sugar. Bidston Park and at Bidston Lighthouse. August.

A. litura, Lin.—Firgrove, Croxteth, Garston on sugar September.

Genus CERASTIS Och.

C. Vaccinii, Lin.—Plentiful on sugar. September and October.

C. spadicea, W.V.—Plentiful in plantations at Wallasey. Sugar during Autumn.

Genus SCOPELOSOMA Curtis.

S. satellitia, Lin.—Plentiful on sugar in woods during autumn.

Genus XANTHIA Oct.

GROUP 1.

X. Citrago, Lin.—This species has been taken about Holt Hill, Bromborough, and the Dingle. July and August. Sugar.

GROUP 2.

X. Cerago.—Plentiful on sugar and flowers, particularly at Hale and Crosby. September.

X. Silago, Hb.—Plentiful from Crosby station to Hightown, also at Birchwood. September and October. Sugar.

X. Aurago, W.V.—Two taken at Lydiate. End of September.

X. ferruginea, W.V.—Common in woods. Sugar. September.

FAMILY 7.

COSMIDÆ Gn.

Genus TETHEA Och.

T. subtusa, W.V.—May be met with on sugar in the plantations at Wallasey where Poplars grow. July.

Genus COSMIA Och.

GROUP 1.

C. trapezina, Lin.—Plentiful in Oak woods. August by beating.

GROUP 2.

C. diffinis, Lin.—I bred a specimen from the larva, taken near Rainhill. August, 1852.

C. affinis.—On sugar in a young Elm plantation between Hightown and Sephton. I have placed its eggs in the Plantations at Wallasey. September.

FAMILY 8.

HADENIDÆ Gn.

Genus DIANTHÆIA, Bdv.

D. capsincola, W.V.—Plentiful where catch-fly *(D. inflata)* grows. June. Over the flowers at dusk.

D. Cucubali, W.V.—Same places as Capsincola; not so plentiful. Sometimes on sugar.

D. conspersa, W.V.—Kirby and Bickerstaffe. July. Found sitting.

Genus HECATERA, Gn.

H. serena, W.V.—In the plantations at Wallasey and Liscard. Sugar. July and August.

Genus POLIA Och.

GROUP 1.

P. Chi.—Generally found on walls and trunks of trees in August.
P. flavacincta, Rœs.—One on sugar at Allerton Hall. Two between Ditton and Hale. September.

Genus DASYPOLIA, Gn.

D. templi, Seb.—Generally taken from the gas lamps around West Derby and Aigburth. September and October.

Genus EPUNDA, Dup.

E. lutelenta, W.V.—On gas lamps with Templi, and comes to sugar.
E. nigra, How.—Crosby, Speke and Lydiate. Sugar. September.
E. viminalis, Rœs.—Where sallows are abundant. Hale and Knowsley. Larva. June. Imago by beating. July.
E. Lichenea, Hb.—May be taken on the coast where stone crop grows. Comes to light. August and September.

Genus MISELIA Och.

GROUP 1.

M. Oxycanthæ, Albin.—Abundant at Sugar. Autumn.

Genus AGRIOPIE, Bdv.

A. Aprilina, Lin.—Plentiful at sugar in October.

Genus PHLOGOPHERA, Och.

GROUP 1.

P. meticulosa, Lin.—Abundant on sugar from August to October.

Genus EUPLEXIA St.

E. lucipara, Lin.—Comes freely to sugar. All summer.

Genus APTECTA Gn.

GROUP 1.

A. herbida, W.Y.—At Birch Wood and Hut of Huts Wood. Sugar. June and July.

GROUP 2.

A. occulta, Lin.—One specimen, said to have been taken at Claughton on sugar, by Mr. Brockholes.
A. nebulosa, Hufn.—Plentiful in woods at sugar. July.

GROUP 3.

A. advena, W.V.—One from Valerian flowers at Hale, one from same plant at Lydiate. June.

Genus HADENA, Och.

GROUP 1.

H. adusta, Esp.—In woods on sugar. July.

GROUP 2.

H. Protea, W.V.—Freely at sugar where old oaks grow. September.

GROUP 3.

H. glauca, Kleem.—Simonswood Moss, Stourton, Prenton and Knocktorum. On Heath at rest. May.

H. dentina, W.V.—Plentiful anywhere, end of May and June, on tree trunks.

GROUP 4.

H. suasa, W.V.—May be taken freely at sugar, where poplars grow.

H. Oleraceæ, Lin.—In profusion about weedy gardens from June to August.

H. Pisi, Lin.—Plentiful on the range of hills which commence at Bidston, and upon the mosses. June.

GROUP 5.

H. thallasina, Natu.—An abundant species. Sugar, June.

FAMILY 9.

XYLINIDÆ Gn.

Genus XYLOCAMPA Gn.

X. lithoriza, Bark.—May be found on walls and trunks of trees in April and May, particularly around Holt Hill.

Genus CALOCAMPHA St.

GROUP 3.

C. vetusta.—Occasionally on sugar at Wallasey and Crosby.

C. exoleta.—Plentiful at Liscard, at sugar, August, September, and October.

Genus CUCULLIA Och.

GROUP 2.

C. Chamomillæ, W.V.—May be found on rails at New Brighton and Waterloo in April, and has been taken, by Mr. Almond, at Bidston Lighthouse.

C. umbratica, Lin.—Plentiful over Honeysuckle flowers in June.

FAMILY 10.

HELEOTHIDÆ Bdv.

Genus HELIOTHIS Och.

H. marginata, Kleem.—This species may be taken at sugar on the coast where rest arrow grows. July.

H. Armigera? Petigera, W.V.—One specimen taken at Linacre, on S. Jacobeæ Flower. August.

Genus ANARTA Och.

GROUP 2.

A. Myrtilli, Rœs,—Plentiful on the wing on heaths and mosses. Summer.

Genus HELIODES.

GROUP 1.

H. Arbuti, Fab.—Between Spittal and Parkgate, and at Orrel and Ford. Flies in the sun, end of May.

Section 5. MINORES.

FAMILY 5.

PHALÆNOIDÆ Gn.

Genus BREPHOS Och.

B. Parthenens.—Birchwood, Woolton, on the wing. May 1st, 1849.

VARIEGATÆ.

FAMILY 4.

PLUSIDÆ Bdv.

Genus ABRASTOLA Och.

A. triplasia, Lin.—In Gardens, particularly over Valerian Flowers. July to August. Larva in weedy gardens. September and October.

Genus PLUSIA Och.

GROUP 3.

P. chrysites, Lin.—Flies over flowers at dusk. June and August.

P. Festucæ, Lin.—Flies over Sweet William and Iris flowers end of May, and over Annuals end of August and September.

P. Iota, Lin.—Flies over Honeysuckle flowers at dusk. July.

P. V. aureum, Engr.—In profusion around West Kirby and Frankby, over Briar flowers.

GROUP 5.

P. Gamma, Lin.—Abundant about clover fields. August.

FAMILY 8.

GONOPTERIDÆ Gn.

Genus GONOPTERA Lat.

G. libatrix, Lin.—Plentiful, flying, near old ditches. Comes to sugar.

INTRUSÆ.

FAMILY 1.

AMPHIPYRIDÆ Gn.

Genus AMPHIPYRA Och.

GROUP 4.

A. tragopogonis, Lin.—Under coping stones and on sugar. August and September.

Genus MANIA Tr.

GROUP 1.

M. typica, Lin.—Abundant about brambles. June and August.

FAMILY 3.

STILLBIDÆ St.

Genus STILLBIA St.

S. hybridata, Hb.—On the wing, at Stourton wood, evening. Hangs on long dead grass at night.

EXTENSÆ.

FAMILY 4.

CATACALIDÆ Bdv.

Genus CATOCALA Och.

GROUP 1.

C. Fraxini, Lin.—Two specimens only have been taken. One in Mrs. Peacock's garden, Saughall Massey, and one in a smithy, at Upton—the latter much burnt.

SERPENTINÆ.

FAMILY 2.

EUCLIDIDÆ Gn.

Genus EUCLIDIA Och.

GROUP 1.

E. Mi., Lin.—Plentifully flying over meadows at Kirkby, Hale, Lydiate, and Parkgate. May. Daytime.

E. glyphica, Lin.—Rock Ferry, Sutton, and Speke. June.

FAMILY 3.

POAPHILIDÆ Gn.

Genus PHYTOMELRA Haw.

P. Ænea, W.V.—Plentiful on Simonswood Moss and Prenton Hill, on the wing, evening. May.

[The foregoing is only a portion of the entire list. The remainder, which was not ready in time to go to press, is reserved for a future volume of the Transactions.—ED.]

PROCEEDINGS,

SEVENTH SESSION, 1854-55.

ANNUAL GENERAL MEETING.

This MEETING was held in the Committee Room of the Lyceum, Bold Street, on Wednesday, the 18th of October, 1854, at Two o'clock, p.m.

THOMAS MOORE, Sen., Esq., in the Chair.

The Secretary then read the following REPORT:

"At the close of the sixth year of the Society's labours, the retiring Council are able to report the condition of the Society, with great satisfaction to themselves, and they trust also, to the Members at large. They believe that they may speak in terms of congratulation, not merely in reference to past results, but to the promises of future success.

"The past Session has been one of more than the average interest, no fewer than nineteen communications, varying in extent and importance, having been laid before the Society at eight meetings. These have been classified, in the contents, under six general heads; and eleven of them have been illustrated by a suitable number of engravings. The Volume for the Session, which is of more uniform interest than some of the others, has been issued to the Members. It was distributed in August; but it was ready in July, and was delayed by the absence of some of the plates.

"The collection of the Society has gone on steadily increasing under the charge of our Honorary Curator, whose exertions on behalf of the Society are undiminished. During the past Session, nearly 100 separate volumes, monographs, and portions of incomplete works, have been added to the Library, mainly by donations and the friendly interchange with other societies of a similar kind. Several objects have also been added to the Museum: and there can be no doubt that if we possessed suitable means of displaying them to the Members and others, a very large number of donations would be added.

"During the past Session, the attention of the Society was occupied on several occasions with a proposition respecting the Union of two or more local societies, whose objects are in a great measure similar. The delegates from four societies unanimously concurred in the propriety of forming a great society in Liverpool, embracing numerous members of various talents and acquirements, and worked in sections. A union of three of those societies was recommended for this purpose, and the members of two of them, (the Historic Society and the Literary and Philosophical Society), adopted this recommendation, both in respect to the fact and the manner of it. New deputies were appointed by these two societies for the arrangement of details, and a Report, dated May 18th, was prepared and printed, the entire rejection of which would not have interfered with the principles previously affirmed. On the 22nd of June the Report was adopted unanimously by the Historic Society, with a resolution allowing a wide margin on the subject of an equitable name, and another providing for the contingency of either rejection or unnecessary delay on the part of the Literary and Philosophical Society. These resolutions were forwarded to that society, but no reply was ever received, either from its Council or Members. Indeed, to this hour, the Members of the Historic Society are not aware, either officially or otherwise, that any resolution has been passed by the Literary and Philosophical Society, respecting the Report of May

18th—of adoption, rejection, or modification. In these circumstances, the Historic Society re-assembled on the 30th of August, and resolved* to act alone on the principles

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* *The following is the Report which was adopted on the 30th of August:—*

"In compliance with the directions of the Society, given on the 22nd of June last, the Council have turned their attention to the possibility which was then contemplated, of this Society standing alone, and extending its objects and operations. The resolutions which were then adopted were duly forwarded to the Secretary of the Literary and Philosophical Society; but no answer has since been received, either from the Council or Members of that body. The time appears, therefore, to have arrived, when the Historic Society should act independently; and its Council are strongly of opinion that the course which circumstances thus point out will be found to be by far the best, not only for the respectability of the Society, but for the interests of general literature and science in Liverpool.

"The Council, however, cannot regret the cordiality and unanimity with which their Members received the proposals of union, emanating, as they did, from common friends. Having no private or personal objects to serve, and being desirous only to promote the public good, by the cultivation of sound learning, they were willing to share their labours, their honours, and their property, on terms of perfect equality. They have the satisfaction of knowing that this feeling is duly appreciated by those whose co-operation they were mainly desirous to secure; but they are unwilling to let the most favourable opportunity pass for securing the *primary* object, in the delays which are attendant on one that is merely *secondary*.

"In the Report which was presented by the deputies from the four principal learned Societies of the town, dated 10th February last, the formation of a great Society with sectional divisions, was unanimously recommended. The reasons of a public character which were then assigned remain unchanged; and those respecting economy in the intellectual and pecuniary expenditure, have acquired, if possible, additional weight. But it was felt from the first that, in any case, the Members of the Historic Society would form the materials of which this great one would mainly consist; and that the plan of publication hitherto pursued by it would, with slight modifications, be the one adopted. This Society, therefore, is the only one that could adopt such a course alone; and it is the only one which will be able to present from its foundation an unbroken series of annual volumes.

"The Laws, which were compiled with much care, as part of the second Report of the delegates, require very little modification to adapt them to the new circumstances of the Historic Society. The following are the principal points:—

"On the subject of a name, they recommend that the original name of the Society be retained unaltered—'The Historic Society of Lancashire and Cheshire.' They are fully aware that this expresses somewhat imperfectly the objects of the Society; but it has always been open, more or less, to the same objection. It is, at the same time, that under which the Members have become favourably known to the learned in the United Kingdom and on the continent. From the very establishment of the Society, too, the Members who have taken the deepest interest in its prosperity have looked forward to the procuring of a Royal Charter; and they will naturally do so now with increased interest and confidence. If a change of name be thought desirable, that will be the proper time to introduce it, when the Society will take rank not merely as the first in a limited locality, but as one of the first out of the metropolis, for the promotion of general learning.

"The Council recommend that the Sections be three in number, instead of four—for Archæology, Literature, and Science, respectively. The last of these would include Natural History, in its various branches, as Geology, Botany, Zoology, and Physical Geography. It so happens that this is the division of subjects in use in the Royal Irish Academy; but it is here suggested, not from imitation or example, but on independent grounds. This arrangement would require no alteration in the present number of ordinary Members of Council. The whole eighteen might at once be divided into those three Sections, according to their respective tastes or acquirements; and the six new Members to be elected at the next Annual General Meeting, would of course displace two in each Section.

"A triennial change in the Officers and Council of the Society has always been recognised by the laws; and to render the threefold division more complete, the Council recommend that there be three official Vice-Presidents (the Mayor of Liverpool and the High Sheriffs of Lancashire and Cheshire), and three elected Vice-Presidents, one at least of whom shall retire annually. On the same principle they would have the maximum limit of Honorary Members a number divisible by three; for example, 36, instead of 40, as recommended in the Report of the 18th of May. They also recommend the adoption of certain verbal modifications before printing the Laws, having reference merely or mainly to improved expression.

"The Council are not yet able to speak with certainty respecting the time and place of holding their meetings. If the Members should think proper, however, to entrust to them the duty of procuring suitable accommodation, they have no doubt of being able to make satisfactory arrangements, of which they will take care that timely notice be given. Although they recommend the formation of only three Sections, it is highly desirable that there should be four meetings monthly. The fourth would be devoted to miscellaneous subjects, and would probably be even more interesting than the ordinary sectional meetings. It would afford opportunities for verbal descriptions of objects illustrative of Antiquity, Natural History, Arts, Manufactures, Manners

of the two Reports of the delegates. The Society accordingly extended its objects and operations from local and special to general; it classified its inquiries under the three heads of Archæology, Literature, and Science; and raised the annual subscription of Resident Members to a guinea, that of Non-resident Members remaining as before.

"Since this last date, upwards of 80 gentlemen selected by the Council have been enrolled as new Members, without entrance fee, the proportion of resident to non-resident being greater than on any former occasion, viz., three to one. The privilege extends, for such gentlemen as may be thought desirable, to the 31st of December; and there can be no doubt that a large number of valuable Members will yet be added. The present list contains about 410—a number larger than would have resulted from a union with the Literary and Philosophical Society, allowing for duplicate Members and a few secessions. The Society has also enrolled during the year 12 Honorary Members,† making in all 27, or three-fourths of the entire number fixed by the new Laws. All of those who were most recently added are eminent for their scientific attainments; so that the list of Honorary Members includes gentlemen of the highest distinction in each of the three great subjects to which the Society directs its attention.

"Since the Society was founded, it has several times joined in invitations to the British Association for the Advancement of Science to honour this town with a second visit; and several of its Members attended, both at Belfast and Hull, to give effect to these invitations. At the latter place the invitation was accepted; and the Members of this Society will not soon forget the interesting meetings which were held last month in the rooms of St. George's Hall. The testimony which was borne to the value of our local efforts, as well as the impulse given to intellectual inquiries, cannot but be highly beneficial to the Members of this Society, as well as to the public generally. The Historic Society's operations for the year were closed by a Soiree‡ given to the

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and Customs; for the reading and discussion of Papers connected with more than one of the Sections; and for the introduction of subjects of general interest, at which an unusually large number of visitors might desire to be present.

"In both Reports, certain duties were delegated to the Council of the enlarged Society, which it was expected to discharge before the commencement of the approaching Session. One of these was the selection of gentlemen of high qualifications, and desirous of the honour, to be enrolled without entrance fee. It was felt that among the Members of the other learned Societies of the town, and among gentlemen who have hitherto not been connected with any of them, there are many whose varied talents and acquirements enable them to advance the interests of the Society, and who are desirous to bear a part in its useful labours. The Council of the Historic Society feel that in the altered circumstances such duties will necessarily fall upon themselves; and they will endeavour to discharge them faithfully and impartially. They believe, however, that after the unexpected delay of three months which has taken place, the limit for such enrolments should be extended from the 18th of October to the close of the present year.

"The Council feel that the congratulations which were expressed at the close of the sixth Session were well founded, and that few Societies in the kingdom, as certainly none in these counties, can present a parallel to their successful and harmonious labours. They entertain the fullest confidence that the present is only the commencement of a new and more distinguished era; and that they will be able to promote the cause of Physical Science, Natural History, Philosophy, Arts and Manufactures, as they have hitherto done that of Literature and local Archæology. Nor could any period be more auspicious than the present for extending the principles and enlarging the operations of the Society. It has given decisive proofs of its capability, and has received in return the amplest evidence of public confidence. It is rich in intellectual resources, as well as in funds and accumulating property; and it will stand before the distinguished men of the kingdom, during their visit to the town, as the principal organised body for the promotion of objects kindred with their own."

† These were selected by the Council, in compliance with a resolution passed on the 30th of August; and they were unanimously elected at a Special General Meeting, held on the 27th of September.

‡ [At the meeting of the Society on the 9th of March, 1854, and again at the meeting on the 6th of April, it was announced that Mr. Mayer had kindly offered to exhibit to the Members of the Society, the whole Faussett collection of Anglo-Saxon Antiquities, recently purchased by himself. About the same time it was intimated that Mr. Thomas Wright, of London, had expressed his readiness to write a paper descriptive of them, and to come down to Liverpool, if necessary, to read it. The thanks of the Society were unanimously given to both gentlemen, and their respective offers were accepted. A meeting for this purpose was fixed to be held in May; but it was found necessary to postpone it till after the close of the Session. On the 11th of July, the Council unanimously resolved to hold the meeting while the Members of the British Associa-

Officers, Members, and Associates of the British Association, at the close of their labours on the 27th ult. The Faussett Collection of Anglo Saxon Antiquities was lent for the occasion by Mr. Mayer; an interesting Lecture descriptive of them was delivered by Mr. Wright, now one of our Honorary Members; and several objects similar in character, and of great interest, were exhibited, chiefly by Mr. John Mather. The whole proceedings were of a unique and most interesting character, and we have evidence that they afforded the highest gratification to the Members of the British Association, as well as to the Members and friends of the Historic Society.

"The retiring Council recommend that the new list of Members be printed early in January next, as the period fixed for enrolling new and desirable Members without entrance fee will terminate shortly before. They also recommend, that those gentlemen whose arrears are equivalent to three sessional payments or upwards, be formally erased from the roll of the Society, if, after due notice, they fail to discharge those arrears before the 31st of December.

"In selecting and recommending persons to fill the various offices of the Society for the next year, and also to supply the vacancies on the Council, the retiring Council have acted to the best of their judgment. They have much pleasure in stating that they

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tion were in the town, and thus to allow the largest possible number to participate in so rare an intellectual gratification. The whole of the Members and Associates of the British Association were therefore invited to be present; the Council in London were requested to name the evening most suitable to themselves; and to give the Meeting a more social character it was arranged that it should take the form of a *Soirée*.]

On Wednesday Evening, the 27th of September, the Soirée was held in the Philharmonic Hall, Hope-street, at Eight o'clock. The Faussett collection was laid out at the lower end of the Hall, in cases provided by Mr. Mayer, the objects being classed and labelled so as to exhibit their character at a glance. Beside them were the Hoylake Antiquities, exhibiting in many instances a similar character; from the collections of the Historic Society, Mr. Mayer, Mrs. Longueville late of Hoylake, and Dr. Hume. A rare and valuable series of miniatures of the Bonaparte family, was also lent for the occasion by Mr. John Mather. A pamphlet was prepared descriptive of this collection, and fifteen hundred copies of it were placed on the seats for the use of the visitors, by Mr. Mather. Fifty copies of the pamphlet descriptive of the Hoylake Antiquities were left in the room by Dr. Hume.

Around the room were suspended a series of silken banners, on which were emblazoned the armorial bearings of the various Presidents of the British Association from its establishment. Each also contained the name or title of the President, the place, and the date. At each end of the hall the royal arms were suspended. Each member of the Society was distinguished by a satin ribbon in his coat, on which was printed "M.H.S. LANCASHIRE AND CHESHIRE."

From eight o'clock, the company were occupied with the inspection of the objects, promenading, &c. During this interval, several interesting pieces of music were played upon the organ.

At half-past eight, the chair was taken by the WORSHIPFUL THE MAYOR of Liverpool, (John Buck Lloyd, Esq.,) Vice-President *ex officio* of the Historic Society. The Platform and orchestra were occupied by the General Committee of the British Association, the Council and Officers of the Historic Society, and a few of their friends.

The Chairman read a letter from the Earl of Harrowby, President of the Association, regretting his inability to be present at the meeting, as the delicate state of his health made it necessary for him to reach home at the earliest opportunity.

The following paper was then read, the Chairman introducing the author to the audience.

ON ANGLO SAXON ANTIQUITIES, WITH A PARTICULAR REFERENCE TO THE FAUSSETT COLLECTION.

By Thomas Wright, Esq., M.A., F.S.A., Hon. M.R.S.L.,

Corr. Mem. of the Institute of France.

At the close of the Paper, which occupied about an hour and a half, a vote of thanks to Mr. Wright was proposed by Lord Talbot de Malahide, seconded by Monckton Milnes, Esq., M.P., and carried unanimously. While these gentlemen were speaking, fifteen hundred copies of the paper, printed in pamphlet form, at the expense of Mr. Mayer, were distributed among the ladies and gentlemen present.

The Mayor then vacated the chair, and during an interval of half an hour, the company were occupied in promenading, inspecting the objects, and obtaining refreshments. The musical performances were also renewed by Mr. G. Hirst, who presided at the organ. The Mayor having resumed the chair, and the company having returned to their places, the remaining business of the programme was proceeded with.

have experienced the hearty co-operation of nearly all, and that the greatest harmony and unanimity have marked their entire proceedings.

"The Council hope to be able, in a few days, to announce to the Members the grant of convenient Rooms for holding their meetings; and due notice will be given of the time and place of holding them, in the first circular to the Members. The Treasurer reports that after the payment of every demand, and of some of a special character, he has still a considerable sum in hand, the details of which will be laid before the meeting. Under the superintendence of the Honorary Curator, a beautiful Diploma has been prepared, which will be ready for delivery to the Members at the various meetings of the Session. The Secretary has much pleasure in adding that upwards of forty Papers have been announced as either ready, or in preparation, to be laid before the Society, only part of which can be disposed of during the ensuing Session.

"The retiring Council have again to express their thanks to the Honorary Curator, for the continued use of a room at his house for the meetings of the Council."

The Secretary announced that by a resolution of the Society, adopted unanimously on the 30th of August, the Council were directed to select the names of a suitable number of gentlemen to be proposed as additional Honorary Members of the Society. The Council had done so; and the Society had confirmed their recommendation, by unanimously electing the twelve gentlemen named at a Special General Meeting held that day in the Committee-room of the Philharmonic Hall. They were the following:—

Charles Cardale Babington, M.A., F.R.S., St. John's College, Cambridge.
Sir David Brewster, K.H., D.C.L., LL.D., F.R.SS.L.&E., Hon M.R.I.A., St. Andrew's, N.B., and Allerby, Roxburgshire.
John Edward Gray, Ph D., F.R.S., F.G.S., &c., British Museum, London.
R. Gordon Latham, M.D., F.R.S., Upper Southwick Street, London.
Sir Roderick Impey Murchison, G.C.H., M.A., F.R.S., F.L.S., F.G.S., Hon. M.R.I.A., 16, Belgrave Square, London.
The Right Hon. the Earl of Rosse, K.P., D.C.L., Prest.R.S., Parsonstown Castle, Ireland.
Richard Owen, M.D., LL.D., F.R.S., F.L.S., F.G.S., Royal College of Surgeons, London.
John Philips, M.A., F.R.S., F.G.S., St. Mary's Lodge, York.
Colonel Edward Sabine, R.A., V.P.R.S., Woolwich.
Rev. Adam Sedgwick, M.A., F.R.S., F.G.S., Trinity College, Cambridge.
Rev. William Whewell, D.D., F.R.S. F.G.S., F.R.A.S., Hon. M.R.I.A., Master of Trinity College, Cambridge.
Thomas Wright, M.A., F.S.A., Hon. M.R.S.L., 14, Sydney Street, Brompton, London.

Several copies of a DIPLOMA for the Society, designed by Mr. Mayer, and executed by Messrs. Maclure, Macdonald, and Magregor, were exhibited to the meeting. It will be forwarded to each of the Honorary Members; and will be ready for delivery to the ordinary Members at the various meetings of Session 1854-55. At the centre of the top is the medallion which formed the design on the cards issued for the Soirée; four figures—Truth and History, Justice and Fame, are in the act of withdrawing a curtain; and thus are exhibited, within a beautiful enriched border, the various styles of architecture, busts of Alfred and Victoria, the costumes of England from the earliest times, the changes in the Royal arms, and several illustrations of English mediæval customs.

The Chairman announced that the Historic Society had gladly taken advantage of that public and special opportunity, to present an Address to the Honorary Curator, Mr. Joseph Mayer. After paying a becoming tribute to Mr Mayer's merits, he called upon the Rev. Dr. Hume to read the Address.

HISTORIC SOCIETY OF LANCASHIRE AND CHESHIRE.

TO JOSEPH MAYER, ESQ., F.S.A., HONORARY CURATOR.

"When it was officially made known to the Historic Society, that you intended to exhibit to the Members and their friends the whole of your recent purchase of Anglo-Saxon Antiquities, entitled the "Faussett Collection," they expressed unanimously their great gratification, and their cordial thanks for your kind offer. They think it right, however, to convey to you a more formal and permanent expression of their acknowledgments; and they believe that the present occasion is a suitable one, when an unusually large number of Members and friends are present, and when the objects are laid out before them.

"Since the period of this Society's inauguration, more than six years ago, you have laid the Members at large under numerous obligations, by the zealous and able discharge of the duties of Honorary Curator. Their property has accumulated rapidly, and its safety has been provided for, not only by your own hands, but beneath your own roof. Nor should it be forgotten, that for some of the most valuable donations they are indebted also to you,—especially for a large number of plates for the enrichment of their printed volumes.

It was moved by JOHN POOLE, Esq., seconded by Mr. STONEHOUSE, and resolved,—

That the Report now read be received, and printed for distribution among the Members.

The Treasurer having read over his Balance Sheet to the meeting, as signed by the Auditors;—It was moved by Dr. HUME, seconded by Mr. BUXTON, and resolved,—

That the Abstract of the Treasurer's Accounts now read be passed and printed with the Report.

It was moved by Mr. STONEHOUSE, seconded by Dr. MACINTYRE, and resolved,—

That the best thanks of this meeting be given to the retiring Council and Officers, for their services during the past year.

A Ballot having been taken for the officers and sectional members of Council by means of the slips forwarded to the Members, the result was announced by the Chairman.

On the motion of the Rev. THOMAS MOORE, M.A., a vote of thanks to the Chairman was passed by acclamation.

"On looking around, at a collection of great intrinsic value and of national interest, the Members of this Society rejoice that it has found a home in Liverpool, and that it is possessed by one of the three gentlemen to whom their large and still increasing Society owes its existence. They believe that in years to come, it will form the centre of a much larger collection, the whole of which will aid in securing a high class of antiquarian research and historical illustration.

"It is no small addition to the gratifications of this evening, that the Members of the Historic Society see around them as their guests and friends, the Officers and Members of the British Association for the Advancement of Science. For the first time those treasures of the tombs have been displayed, after nearly a century of collection and preservation; they have been explained in a lucid and interesting discourse; the subject is intimately related to the inquiries both of the British Association and the Historic Society; and it must henceforward take its position as an important branch of Science. The Faussett collection, however, is not the first subject, in connection with which the Members of this Society have had an opportunity of admiring your public spirit. In the general promotion of Science and Art your enthusiasm is well known; and you have added to the attractions of Liverpool a valuable collection of Egyptian, Etruscan, Roman, and other antiquities.

"May you be long spared in usefulness and honour, to witness the good effects of enlightened and generous conduct; and may your example incite others to similar acts, by which they will secure, in like manner, the esteem and gratitude of their fellow citizens."

The Address was beautifully engrossed on vellum, and surrounded by a border containing illustrations of Egyptian, Etruscan, Greek, Roman, British, Saxon, and Mediæval objects in Mr. Mayer's own collection. The whole was enclosed in a handsome morocco case.

Mr. Mayer replied briefly, thanking the Society for the honour which they had done him, and the meeting in general for the cordial manner in which they had exhibited their sympathy.

The Chairman next exhibited a handsome bowl, made in the form of a "MAZER BOWL," or Saxon drinking cup, and stated that the Historic Society had prepared it for presentation to the Earl of Harrowby, President of the British Association, as an interesting memorial of the evening's proceedings. It was lined throughout with silver, and surrounded externally with two silver bands, the inscriptions on which he read to the meeting.

"Presented by the Historic Society of Lancashire and Cheshire, to the Earl of Harrowby, at a Soirée given by the Society to the British Association for the Advancement of Science. Liverpool, September 27th, 1854."

"This bowl is formed of wood taken from the house at Everton used by Prince Rupert as his head quarters during the Siege of Liverpool.

Lord Talbot de Malahide having been appointed to receive the bowl for Lord Harrowby, the Chairman filled it with wine and presented it to him.

His Lordship briefly expressed his best thanks on the part of Lord Harrowby, for such an appropriate souvenir; and his great personal gratification at the entire proceedings of the evening. He concluded by draining the bowl to a time-honoured toast,—"The good old town of Liverpool, and the trade thereof." This was done amid great applause.

The National Anthem was then played upon the organ, at the close of which the meeting broke up.

"TIG"

IN THE COLLECTION OF J MAYER. F.S.A.

ORDINARY MEETINGS, HELD IN ST. GEORGE'S HALL.

14*th December*, 1854. LITERARY SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

A long list of Donations which had been received since the close of last session, was read over by the Curator. It was arranged that they should be classified and formally presented on the evenings devoted to Archæology, Literature, and Science, respectively.

Mr. Mayer exhibited a *Tig* or drinking cup with four handles. It is of earthenware, and of the date 1612; being one of the oldest known to exist. Some remarks were made respecting three-handled tigs; and also respecting the general resemblance of this one to the Irish "mether." Several representations of it were handed round, from an etching which had been executed by F. W. Fairholt, F.S.A. (*See Illustration.*)

Mr. Fairholt exhibited an English Brank or Scold's bridle from Mr. Mayer's Museum, also a drawing of a similar instrument from Germany; both being illustrative of a communication which he was about to make.

The Chairman mentioned that a part of his paper on Churches and Chapels of Liverpool, printed in the Society's volumes iv and v, had led to extensive inquiries respecting family history, from gentlemen in the United States of America.

The following Papers were then read:—

On a Grotesque Mask of Punishment, obtained in the Castle of Nuremberg, by F. W. Fairholt, F.S.A.;—and on Cowley and the Poets of the Seventeenth Century, by David Buxton, Esq.

21*st December*, 1854. SCIENTIFIC SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations to the Society were laid upon the table:—

From the Author, Thomas T. Wilkinson, F.R.A.S. An Account of the early Mathematical and Philosophical Writings of the late Dr. Dalton, pamph. Manchester, 1854.

The Lancashire Geometers and their Writings, pamph. Manchester, 1854.

Memoir of the Rev. John Lawson, B.D., Rector of Swanscombe, Kent, pamph. Manchester, 1854.

On Bisectant Axes, and their relation to the Radical Axes of two or more given Circles, pamph. London, 1852.

Mathematical Papers on Circles of Tangential Ratio, and their relation to radical Axes and Circles of Similitude, pamph. London, 1854.

From the Author, Theodore W. Rathbone, Esq. Comparative statement of the different plans of Decimal Accounts and Coinage, which have been proposed by the witnesses examined before the House of Commons, and by others, pamph. London, 1854.

From the Author, James Bedford, Ph.D. New Theories of the Universe, explaining how the Sun, Moon, Stars, &c., are formed, pamph. London, 1854.

From the Authors, Maria Emma Gray and Dr. John Edward Gray. Figures of Molluscous Animals, from various Authors, etched for the use of Students by Maria Emma Gray; and a list of the Genera of Mollusca, their Synonyma and Types, by Dr. John Edward Gray, F.R.S., F.L.S. 4 vols. 8vo. London, 1850.

From Samuel Richardson, Esq. Tables illustrative of the Decimal System, in Coins, Accounts, Measures, and Weights.

Mr. Buxton drew attention to the fact of the death of Professor Forbes, who had lately taken a prominent part in the Scientific meetings held within that building. He thought that at the first Scientific meeting of the Historic Society, they should record their sorrow for the event, and their regret for the loss which Science had sustained by his decease. In this suggestion the meeting unanimously concurred.

Dr Hume made some remarks on Christmas Carols, their nature and antiquity; and quoted passages from some of the absurd ones of modern times. He also drew attention to one of the Chester Mystery Plays, of the Sixteenth century, entitled "the Nativity," showing that it abounded with local allusions, and illustrations of the manners of the period.

Mr. Poole exhibited and explained several instruments for the extraction of bullets from gun-shot wounds. They had been lent for the purpose by Mr. Thomas Reay. They included the ancient bullet forceps; the French screw for insertion into the bullet; and the more recent instrument consisting of a groove or scoop and retaining points.

On the subject of Decimal Coinage, some remarks were made by Mr. Richardson, in explanation of the table which he presented.

Mr. W. Milner, one of the patentees, exhibited and explained the following objects. Several locks, showing various principles of construction; water colour drawing, exhibiting a section of the door of a safe; mode of packing the door of a safe, so as to prevent the effects of drilling by thieves; mode of governing the bolts in locks of the largest size; model box, showing the various plans which have been patented for resisting fire; model of the new safe-door, which is retained by a sheet of metal all round.

The following Paper was then read:—

On the Powder-proof Solid Lock, and Safe Door. *By W. Milner, Esq.*

Before exhibiting and explaining these objects, Mr. Milner entered into a brief account of the efforts which he had made for opposing an effectual resistance to fire. During a period of about fourteen years five successive patents have been obtained, improvements gradually suggesting themselves on a principle originally good. The chambers of the safes are filled with materials combining the mutual re-action of non conduction and vaporisation, so that no greater temperature can exist than 212° Fahrt. in the interior of the safe, and among its contents. Safes constructed upon this principle have often been subjected to the most intense heat without injury to their contents.

The mode of fastening safes, so as to present obstruction to their opening, either through accidents at fires or in case of robbery, has also attracted great attention. The safes have therefore become currently known as "holdfast and fire-resisting." Within the last twelve months, however, a new mode of opening safes has been frequently resorted to by thieves, viz., the insertion of gunpowder into the lock, the explosion of which unfastened the door. Against such a mode of operation no safe of previous construction was secure, and thus the name popularly accorded became inapplicable.

The powder proof solid lock is intended to prevent the possibility of using gunpowder, and the principle of it is—presenting a solid mass of metal, except at the very small orifices for the insertion or withdrawal of the key. There is thus no chamber within the lock to admit of the accumulation of gunpowder through the keyhole. An ordinary lock, suited to a middling sized safe, constructed on the ordinary or old principle, would admit about half a pound of gunpowder, while larger locks would, of course, admit of a greater quantity. But the solid lock, known as the six lever, did not afford space for more than half a thimbleful of gunpowder. To obviate still further the possibility of applying gunpowder, Mr. Milner showed that the chamber in which the lock was placed was completely filled up with soft spongy wood, which, in the event of being penetrated with a drill, would of itself half fill the aperture. As a still further protection, however, this wood is shielded by a plate of hardened steel, which would resist almost any attempt at boring. The peculiarity of the new safe door is, that instead of being retained in its place by a single bar, or by

several bars, a sheet of metal is thrown out at top, bottom, and sides, almost as if the whole were a solid mass.

Allusion was made to several interesting experiments, in which official persons had been invited to witness the effects of these improvements. Whilst safes of the ordinary kind were readily blown to pieces by the insertion of gunpowder at the keyhole, those constructed upon this principle remained unchanged, excepting the accumulation of a little dirt from the explosion.

4th January, 1855. ARCHÆOLOGICAL SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations to the Society were laid upon the table:—

From the Society of Antiquaries, London. Archæologia, vol. xxxv, part 2.
Proceedings of the Society, Nos. 37, 38, 39, 40.
List of the Fellows, 1854.

From the Society of Antiquaries of Scotland. Proceedings of the Society, parts 1 and 2.

From the Cambridge Antiquarian Society. Report No. 4, 1854.

From the Kilkenny Archæological Society. Transactions, vol. ii, parts 2 and 3.

From the Library and Museum Committee of the Town Council. Second Annual Report of the Free Public Library of Liverpool, and Derby Museum, 1854.

From the Author, Beriah Botfield, Esq., F.R.S., F.S.A. Account of the Roman Villa, and of the Discoveries on Borough Hill, pamph. 4to. London, 1854.

From the Author, John Harland, Esq. Memoir of the late John Just, of Bury, pamph. Manchester, 1854.

From the Author, Charles Roach Smith, F.S.A. Collectanea Antiqua, vol. iii, part 4.

From the Author, Robert Rawlinson, Esq. Report presented to the Board of Health, on a Preliminary Inquiry, respecting the Borough of Malton, pamph. 1854.

From the Authors, W. J. Mason, Esq., Architect, and A. W. Hunt, B.A. The History and Antiquities of Birkenhead Priory, illustrated by Views, Plans, and Elevations, together with Views of the Churches formerly connected with the Priory. Dedicated to the Historic Society. Sm. fol. London, 1854.

From Edward Benn, Esq. A View of the History and Coinage of the Parthians, by John Lindsay, Esq. 4to. Cork, 1852.

From J. W. Whitehead, Esq. Afbildninger fra Det Kongelige Museum for Nordiske Oldsager, i Kjöbenhavn. Ordnede og for Klarede, af J. J. A. Worsaae. Kjöbenhavn, 1853.

From Thomas Dorning Hibbert, Esq. A large perforated stone malleus, axe-shaped on one side.

Mr. Robson exhibited a bronze paalstab of an interesting shape. It had been found near Warrington, on the Cheshire side of the Mersey.

Mr. Clements exhibited the following articles. An ancient Padlock, found in an excavation in Bond street, London; a pair of ancient iron nut-crackers, on the principle of screw-pressure; two pieces of the Gun-money of James II; and several well executed photographic views.

Mr. Clements also exhibited two ancient oak panels with carving; and drawings illustrative of them from Caxton's edition of "Reynard the Fox."

Mr. Benn forwarded for exhibition the following articles, illustrative of his paper:—A Roman bead; four other beads of very singular forms; a red coloured bead, rude in form and material; thirty beads of various kinds; two with different colours laid on; a piece of glass ornament, belonging, it is supposed, to the Saxon period; some small beads, like garnet, said to have been found in a cairn.

The Chairman stated that an inquiry had recently taken place in Edinburgh, the result of which was yet unsatisfactory, respecting the Architect of Heriot's Hospital. The names of four persons had been suggested; viz. Inigo Jones, Walter Balcanquhall, D.D., and two of the master masons who were first engaged in erecting the building.

The following Papers were then read:—

Ancient British Antiquities, No. 2.—Objects in Glass, by Edward Benn, Esq.; and DESCRIPTION OF TWO ANCIENT CARVED OAK PANELS. *By John Clements, Esq.*

The origin and history of these panels is not known. They may be local, but probably are not. When they came into the hands of their present possessor, they were covered with a thick coating of whitewash; in which state it is not probable that they had travelled far. They form a pair, each being eighteen inches long, by ten broad. They are a good deal worm-eaten, but still in good preservation. The carving is very rude.

No. 1.

This represents the legend of "St. George and the Dragon." The tail of the dragon is peculiar, being very short, and curled like that of a dog. The animal also wants wings, and has in general a less formidable appearance than usual. The lance or tilting spear of the Saint seems also to be omitted.

The Princess Sabra is placed at the top of the panel, holding a sheep in a leash. She stands apparently on a hillock, like an inverted bowl, and the sheep which seems struggling to obtain its liberty, is suspended in mid air. The horse of the Saint seems to move along the ridge of the dragon's back; a rabbit or hare has leaped up in front of the horse; and the Saint has his sword raised, no doubt actually to wound the dragon, but apparently to assail the rabbit or hare in front. The head of the horse is curbed in, and his eye, judging from the rude carving, looks forward with some alarm.

The arms of the princess are carved of a most unnatural length; she could easily touch the ground with her fingers, without stooping. Her dress too is peculiar; the falling band and flat cap reminding us of the costume of a boy in some of our charity schools. From the disproportion between the parts of the horse's body, the carver seems to have commenced at the head, without a complete drawing, till, finding that there would not be room for the whole animal on the panel, he made the best compromise he could with the hind quarters. The horse has a double girth, and the crupper is ornamented with bells, like hawks' bells.

The artist seems to have tried to represent the popular tradition respecting St. George, as conveyed in ballads and legends. The presence of the hare is difficult to be accounted for. From the square-toed Sollerets, the Lambois, the Bourgonet, and other indications in the armour, the date of the carving may be safely referred to the reign of Henry VIII.

No. 2.

This panel is partly heraldic, but the symbols have not been explained. The illustration of the mediæval legend is at the upper part of it, in two divisions. The scenes represented are from the well known story of "Reynard the Fox," which was translated and printed by Caxton in 1481. One portion of the carving is a scene from Chapter iii. of Caxton's book, and another from Chapter v.

The former is entitled "Chantecleer the Cock complaineth of Reynerd the Fox;" and represents a procession of Chantecleer and his family to the king, carrying the body of *Copple*, one of his daughters, who had been killed by Reynard. He at the same time mentions the slaughter of various other members of his family. After an allusion to his happiness, and the extent of his family, he relates the treacherous manner * in which Reynard had imposed upon him, and how at length the dead body of

* "At last he came in the likeness of a hermit, and brought me a letter to read, sealed with your Majesty's seal, in which I found written that your highness had made peace throughout all your realm, and that no manner of beast or fowl should do injury one to another, affirmed unto me that for his own part he was become a monk or cloystered recluse, vowed to perform a daily penance for his sins; showing unto me his beads, his books, and the hair shirt next to his skin, saying in humble wise unto me, 'Sir *Chantecleer*, never henceforth be afraid of me, for I have vowed never more to eat flesh. I am now waxed old, and would only remember my soul, therefore

Copple his daughter had been rescued from Reynard's mail, by the interference of a pack of hounds.

The first illustration represents the dead body of Chantecleer's daughter in Reynard's mail, with the head and neck hanging out. The attitudes of the bereaved father and children fully express their great sorrow.

In the next scene, the king sends Bruin the bear to bring Reynard to Court, to answer the accusations made against him, "And full of jollity the bear departed, if his return be as jovial, there is no fear of his well speeding." Reynard, however, tempts the bear with kind words and promises of great store of honey; and takes him to the house of Lanfert, a stout and lusty carpenter, in whose yard there was a large oak, which he and his sons had commenced to cleave. The bear was persuaded that there was an immense amount of honey in the tree, but when he had inserted his head, Reynard withdrew the wedges. Escape was now impossible; Lanfert, his family and friends,* were thoroughly roused; and the bear at length succeeded in extricating his head. A vigorous attack was then made upon him, the last stroke being dealt by the carpenter's brother.

The second scene on the panel illustrates the concluding part. Lanfert's brother is dealing the final blow; and a flying bird probably represents one of the domestic fowl which had been roused by the noise and clamour.

11*th January*, 1855. LITERARY SECTION.

PETER R. M'QUIE, ESQ., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations were laid upon the table:—

From John Hall, Esq., Lancaster. The London Magazine and Monthly Chronicle, for 1737.

Speed's account of England, Wales, Scotland, and Ireland, with maps, 12mo. 1676.

A Volume of Pamphlets, f.cap. 4to., 1703 and 1704.

A volume containing the *Chester Chronicle* and other local newspapers, 1799.

From the Author, Dr. Kendrick. The Warrington Worthies, 4to. pamph. 2nd edition.

From Mrs. Matthew Gregson. Gregson's Fragments relative to the History of Lancashire, with additions. Sm. fol. 1807.

The Rev. Thomas Moore, M.A., exhibited maps, drawings, and prints illustrative of his paper.

The Secretary laid upon the table copies of the new Laws just printed off, and copies of the new List of Members.

I take my leave, for I have yet my noon and my even song to say;' which speaking he departed, saying his *credo* as he went, and layed him down under a hawthorn; at this I was exceeding glad, that I took no heed, but went and clocked my children together, and walked without the wall, which I shall ever rue."

* "This army put Bruin into a great fear, being none but himself to withstand them, and hearing the clamour of the noise which came thundering upon him, he wrestled and pulled so extreamly, that he got out his head, but left behind him all the skin and his ears also; insomuch that never creature beheld a fouler or more deformed beast, for the blood covering all his face and his hands leaving the claws and skin behind them, nothing remained but ugliness; it was an ill market the bear came to, for he lost both motion and sight, feet and eyes; but notwithstanding this torment, Lanfert, the priest, and the whole parish came upon him, and so beoudgelled him about his body part, that it might well be a warning to all his misery, to know that ever the weakest shall still go most to the wall. * * * The poor bear in this massacre, sat and sighed extreamly, groaning under the burthen of their stroaks, * * till Lanfert's brother, rushing before the rest with a staff, struck the bear in the head such a blow, that he could neither hear nor see, so that awaking from his astonishment, the bear leapt into the river adjoining."

The following Paper was then read:—

SOME NOTES ON THE PARISH OF WEST KIRKBY, IN THE HUNDRED OF WIRRALL, *By the Rev. Thomas Moore, M.A.*

[NOTE. The paper, as read before the Society, was of considerable length, and entered into various details, under separate headings, as in the writer's paper on Kirkby in Lancashire; Vid. vol. VI. What follows, is a selection from, or rather an abstract of, the original paper.]

The parish is situated at the mouth of the river Dee, on its right bank. It is a Rectory, and valued in the King's Books (made by order of Henry VIII., 1535,) at £28. 13. 04.

During the Protectorate, in the Parliamentary survey of 1649, the tythes are stated to be worth cxxv*l* per annum, £25 being allotted to Mrs. Glover for her fifths. "The present minister is one Mr. Monerott or Monroe (omitted by Ormerod) who was presented thither by the Committee of Plundered Ministers." Vol. iii. c. Lamb. MSS. (Vid. Gastrell's Notitia, by Raines.)

By the return made in reply to the orders of the Governors of Queen Anne's Bounty, dated 22nd Feb., 1704, the value was as follows:—

West Kirkby (township)	£140	0	0
Glebe—5 closes, containing about 11 acres, worth	8	0	0
Some small tenements, paying a constant rent of	1	2	0
Tythe of Greasby, Calder, and Little Meols	100	0	0
Tythe of Frankby and Great Meols	25	0	0
	£274	2	0

The value in 1834 was £703.

Ormerod supplies a list of Rectors from the time of King Stephen. At that period the living descended from father to son, till the Lateran Council (1215) condemned this mode of succession. From that period the Abbot of St. Werburgh was the patron, till the time of Henry VIII., when it came to the Dean and Chapter of the new See of Chester.

Thomas Williamson, in 1670, seems to have been the first actually presented by the Dean and Chapter. He lived till the year 1696, before which date the Registers commence. In the Registers, which begin in 1692, under the year 1696, we have this notice:—

"In this year, Mr. Williamson, parson of this parish, died, and was buried at Liverpool."

The entries seem to be in his writing almost to the day of his death, viz., "Burials 8 Sept., Weddings 28 Sept."

His successor, Dr. Wroe, was instituted November 6th following. He was born in 1641, in the parish of Prestwich; was B.A. of Jesus College, Cambridge, in 1661, and Fellow in 1662; was Chaplain to Bishop Pearson in 1678, who gave him a stall. In 1684 he was appointed Warden of Manchester, "having (says Dr. Ware, Hist. Coll. Ch. Manchester,) by his eloquent exhortations, obtained a celebrity which no head of the College had perhaps ever enjoyed." He resigned the Vicarage of Garstang on becoming Rector of West Kirkby. He published three or four sermons, now very scarce. (Vid. Raines' Gastrell, vol. i. p. 30 n.)

As a continuation of the list in Ormerod, we copy from the Register Book the following Memorandum:—

"Thomas Trevor Trevor, Prebendary of Chester, was presented by the Dean and Chapter of Chester to the Rectory of West Kirkby, on the decease of the Rev. Dr. Pearce, March 10th, 1803, instituted March 29th, and inducted April 5th."

Dr. Coplestone, Dean of Chester, was presented to this Rectory on the death of Dr. Trevor, in 1827. On Dr. Coplestone's promotion to the See of Llandaff, the living was given by the Crown to Dr. Murray, Lord Bishop of Rochester, in 1828, and on the Bishop's resignation, it was presented by the Dean and Chapter to the Rev. James Slade, Prebendary of Chester, February 1829, and he was inducted on the 24th of April following.

It may not be uninteresting to give a list of the Curates of this Church, as far as they are known. The Registers supply us with the following information :—

William Walker, Magister Artium....	1697 (Sept. 1st.)		
Tho: Richardson	1711	1723	
Geo. Hodson	1726	1758	
Wm. Robinson	1759	1779	
L. Wetenhall	1779	1780	
J. Newton	1780	1822	
Jos. Fish, Dec. 30, 1821	1822	1823	Left March 9.
P. Parker, July 13, 1823	1823	1824	Do. Oct. 3.
G. H. Pettingal, Oct. 10...	1824	1825	Do. Oct. 30.
Richard Sawley, Nov. 20	1825	1827	Do. April 15.
C. B. Stevenson, July 6	1827	1828	Do. April 20.
W. Armitstead, May 11	1828	——	

We can thus supply a list for nearly a century and a half. The curacy was held on an average for thirteen years, but if we deduct seven years, during which time six curates came and went, we have an average of more than twenty-seven years for each of the others, and we may say that five curates virtually cover the entire space. Mr. Newton, who held it for 42 years, is still well remembered, and some of his family reside in the neighbourhood.

In a former volume of the Proceedings and Papers of this Society, the Church of West Kirkby was made familiar to the members by four plates, representing each side of the church. They were contributed by James Middleton, Esq., F.S.A.

The church is dedicated to St. Bridget. The date when the present church was erected, I have not seen recorded anywhere, but most probably is has existed since before the Reformation. It has not much architectural pretensions, but the tower is good, and the western doorway worth attention.

The church originally consisted of a tower, nave, chancel, and north aisle, and this could have been readily discerned formerly from the outside, as there was a double roof. At present both nave and aisle are under one roof, by the alterations made in the year 1788. There are many evidences of the original condition of the church still existing. In the tower may be seen the grooves, where the roof of the nave was joined to it; in the east end, the later masonry, by which the two gables were made into one, is readily detected, as well as the dressing of the stone which formed the old gables. The same features may be observed in the west end of the aisle. In the inside there are marks which would lead one to suppose that there had been a row of pillars between the nave and aisle, as in the chancel wall, the spring of an arch is easily detected through the plaster.

The outside walls of the church are the same as they were built, with the exception of the south wall of the the nave, which originally was farther out, and not in a line with the chancel. For application was made to the Bishop for permission to make the following changes, viz., "to take down the south wall and rebuild it in a line with the chancel; to new-roof the whole building, and cover it with ton slates, &c." "The expenses of the above alterations to be defrayed by the sale of lead on the roof, &c."

In the Churchwarden's book will be found a statement of the price of the lead sold, amounting to upwards of £300, and of all the items of expenditure. The whole expense amounted to little above £400.

The new workmanship is very inferior to the old, and it requires but little attention

to tell where it begins and where it ends. The new buttresses are very poor, and much inferior to the others. The alterations were completed in a year, as application was made in August, 1788, and the new sittings were allotted on 23rd August, 1789. How they were then arranged may be seen on a large tablet in the church, on which the names of the parishioners are printed, and the number of pews or sittings to which they are entitled.

In the east end are three windows, one to the chancel, one to the aisle, and a small one to the vestry. The chancel window, round-headed, and of five lights, is between the two buttresses, which mark the chancel from the outside. The aisle window is flat-headed, and of four lights. The vestry window is small and round-headed. These windows are not on the same level, the chancel window being higher than the others. They are on a level with a string course, which runs all along the east end, and chancel (south side,) and vestry (north side).

On the south side of the chancel the ground falls away. There is a second bevelled course, in a line with the lower bevelling of the chancel buttresses. The chancel had three windows on the south side, of which the two most easterly are closed. They had drips originally. The chancel wall is bevelled off at the top of the window, but this is not the case in the new wall. The upper string course, originally all along the south side of the chancel is now interrupted between the second and third buttresses. The priest's door has been built up.

The north side has four buttresses, and five windows, four of three lights, and one of five lights. The north door which seems not to have had a porch, is closed up. On the right side, as you would enter, there is an inserted stone, which probably fills up what was once the holy water receptacle.

The tower occupies the greater part of the west end. Its doorway has between the mouldings, at the top, four shields, but they are not easily assignable to their proper owners. The shields are separated by four bosses. In the corners are two quatrefoils. The effect of the weather and time is seen on the mouldings, particularly those on the south side, which being exposed to the north blast, are much eaten away. The tower has at the bottom two chamfered bevels. Above the door is a round-headed window, partly built up, and partly modern; and higher still, the belfry window (one of four, there being one on each side of the tower), consisting of four lights, with trefoil ornaments. In the north side of the tower is a quatrefoil, opening to light the stairs, but its mouldings are almost worn away. Against the north end of the tower, and west end of the aisle, a Day School was built by the Rev. Henry Sawley, who was curate 1825-1827. It has been removed since, but traces of it are still visible. There is a neat window of two lights in the west end of the aisle.

In the interior of the church, we observe in the chancel two sedilia and a piscina, rising above each other in regular succession, and ornamented with trefoil tops. In the piscina is inserted a freestone slab, with an inscription in memory of Dr. Trevor's eldest son. There is a bracket on the north side of the east chancel window, probably for an image of the Virgin, and there is another bracket similarly situated with regard to the east window of the aisle. The chancel was evidently approached by steps in former days, as the floor makes a very perceptible descent towards the body of the church. In the chancel a portion of the old roof is visible, but all the rest is flat and plastered. The pewing is all modern, with the exception of a few old benches, with carved ends. Some of the old carving is preserved, and on one of the pews there are the characters W. C. 1628.

What is now known by the name of the Glegg Chapel, might be more appropriately described as the Glegg Vault. It is situated at the east end of the aisle, and is built up to the height of four feet, and flagged on the top. This is surmounted by a wooden screen, entered by folding doors, which seems, from the inscriptions on it, to be of some antiquity.

The Vestry is built against the Glegg Chapel, and is approached from the inside of the church by three stone steps. The level of its floor is at least four feet above the

church floor, and may have been more formerly. There is a curious trefoil opening in the wall, about half a foot above the vestry floor. It is most likely that the vestry floor and that of the church were formerly on the same level, and that the trefoil was for the priest to observe what was going on in the church.

The entrance to the tower is by a square headed door, and in it there are the remains of a groined roof. There are five bells, with the following inscription :—

1719. ABR: RUDHALL CAST US ALL
JOSS. IENNINGS, JNO. TOTTLEY, CH. WARDENS.
MR. THOS. RICHARDSON, Curate.
MR. JOHN GLEGG, A GOOD BENEFACTOR.
PROSPERITY TO THE PARISH. 1719.

The Parsonage House is commodious, and in great part modern. It is pleasantly situated between the church and the ridge of hills which divide the parish into two portions. The grounds have been enclosed, and trees planted, under the auspices of Rector Slade. There was a disputed right of way through the Parsonage grounds, as the occupants of two farms, which lay close by, claimed the right to pass down through them to the Dee shore. Mr. Slade put an end to a dispute* which had been handed down to successive rectors, by leaving a pathway, when he walled in the Rectory grounds.

With respect to the division of the Common we find the following memorandum :—

" The 10 of September 1709 the Common was divided and the seventh Lott fell to the Re Dr Richard Wroe and doll stones marked with his name was sett accordingly at both ends and middle, thus $\frac{D}{RW}$ with ane + at the tope and P for parsonadge."

There was formerly a pathway through the Churchyard, which was turned in 1851 along the east wall, by building a new wall on the Rectory ground. There is a notice to this effect in the Churchwarden's books, under the date of July 18th, 1851.

Owing to the Grange School established by Bennett's Charity, there was no School attached to the Church till Mr. Sawley built the one alluded to above. The present School was built by Mr. Slade at his own expense in 1844, and is a mixed School. The boys at seven years of age go to the Grange School.

There are several tombs in the Church, most of them of the family of Gleggs, some of the Urmson family, &c. The one perhaps of greatest interest, is the monumental inscription inserted in the built-up Priest's door. The slab is red sandstone, on which is a coat of arms rudely figured, consisting of a plain cross, eagles as supporters, and surmounted by a coronet. The following is the inscription :—

H: S: E: IOHANNES VAN:
ZOELEN: NUPER DE CI:
VITATE BRISTOLIEN:
SIS GENEROSUS QUI:
OBIIT 3: TIO DIE SEPTE
MBRIS ANNO DM. 1689.

Van Zoelen is supposed to have been in Duke Schomberg's army, which lay encamped on the Meols in the parish in this year. Ormerod gives a reference to Leigh's Lancashire, as if to prove this, butthe passage only states the fact of the army having encamped there, and says nothing whatever of Van Zoelen. I have not been able to discover any information on the subject, but I think it is quite safe to infer that he did belong to the Duke's army, and having died, was buried in the nearest Church.

The south and north walls have several large tablets affixed to them, on which are printed, the various bequests made by pious individuals to the parish, the allotment of

* In the Registers we find the following memorandum :—
1708. To all ensewing parsons of West Kirby, that Joseph Jennings and John Barclay have not heighway up through the parsonadge ground, to their ground, but by the Lane. This was stopt by Dr. Wroe himselfe, upon my information that I had from others, by reason that their ground is nothing but a pairt of the Townfield, though Joseph Jennings enclosed it in anno 1707, and that the way is through the town field, over Mr. Betsone's headland or butte.

the pews, and one of great interest, being a copy of the Terrier, which we think of sufficient interest to append.

TERRIER.

A True copy of a Terrier of the Tithes belonging to the Rectory of West-Kirby made in the year one thousand seven hundred and twelve according to the articles of the Right Rev. Father in God Wm Ld. Bp of Chester.

Corn every eleventh hattock
Hay the same
No aftermarth nor Agistment. Mortuaries
for forty pounds, if debtless 0 10 0
For twenty pounds 6 8
For ten pounds 3 4

Oblations

Husband and wife 5
Servants if more than one 2
Eggs for each old House 3
ditto Cottage 1½
Each garden one penny
Each cow one penny (no milk)
Calves, not more than four, for each ¼
Do, if more than four for each 4
Lambs, not more than four, for each 1
For five ditto 10
From six to ten for each one penny or the Lamb wool of the sheep, only
Every tenth fleece
Hemp and Flax every tenth bundle
Geese every tenth
A colt twopence
Pigs every farth—if more than two, one pig
But the second farth free
Tythe Herbage, if no parishioner twopence per pound
There are no impropriations which we know of
There are no augmentations wh we, &c.
Copyed from the Cathedral Register, December the seventh in the year of our Lord one thousand Eight Hundred and Twenty eight.

18*th January*, 1855. SCIENTIFIC SECTION.

HENRY DAWSON, ESQ., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations were laid upon the table:—

From the Literary and Philosophical Society of Liverpool. Proceedings, during the forty-third session, 1853-54: including within the same covers, as an "Appendix," the Fauna of Liverpool, by Isaac Byerley, Esq.

From the Statistical Society. Journal of the Society, eleven volumes, vi to xvi inclusive.

Index to the first fifteen volumes.

Part 4 of vol. xvii, (1854.)

Mr. Sansom exhibited several interesting varieties of Ferns from the Azores.

Dr. Hume exhibited a silver brooch ornamented in niello, of the kind usually known as Rob Roy's brooch. It is the property of Mrs. Kirkland, Everton.

In drawing attention to the rapid rise of Melbourne in Australia, Mr. Stonehouse exhibited an original map of the town and neighbourhood.

Mr. Poole exhibited and explained the revolving rifle, lately patented by Mr. Bentley of this town. The objects secured by it are unusual rapidity in the discharge of its five barrels, and greater steadiness of aim. Mr. Poole also exhibited a model, showing the working machinery of the Lock.

The following Papers were then read:—

Description of Plans for Temporary Houses, for Encampment, &c., by G. W. Stephenson, Esq.; and—

REMARKS ON THE RAINFALL AT WARRINGTON, DURING A PERIOD OF ELEVEN YEARS. *By Tho. Glazebrook Rylands, Esq.*

The observations of the rain-fall at Warrington extended over eleven years (1844-1854). The results compared were observed by Mr. Sharp during the three years (1844-46); by Mr. Rylands during six years (1847-52); and at the Museum and Library during two years (1853-54). The gauges were compared with each other, and gave the same results.

The following table shows the yearly rain-fall, the gauge being on the ground:—

Year.	Inches.	Year.	Inches.	Year.	Inches.
1844.	23·73.	1848.	33·75.	1852.	41·46.
1845.	30·12.	1849.	33·98.	1853.	28·25.
1846.	30·29.	1850.	27·79.	1854.	27·18.
1847.	36·71.	1851.	31·48.		

Mean yearly fall, 31·338 inches. Mean defect of a gauge elevated 34½ feet, 14 per cent. (2 years.) Greatest fall in twenty-four hours, 2·16 inches, on September 6, 1844, and July 9, 1853.

The distribution of the mean annual fall throughout the year is contained in the following:—

Distribution of the Mean Annual Fall through the year.

Month.	Extreme falls recorded in each month.		Mean fall of each.		
	Greatest.	Least.	Month.	Quarter.	Half-year.
January..	4·40 (1852)	1·75 (1848)	2·841.		
February...	4·58 (1848)	0·68 (1845)	2·021.	6·800	
March	2·76 (1851)	0·45 (1849)	1·438.		12·560
April	4·42 (1843)*	0·35 (1852)	1·620.		[10 : 16]
May	3·93 (1847)	0·02 (1844)	1·863.	6·260	
June	4·47 (1851)	1·00 (1850)	2·777.		
July	4·84 (1849)	1·64 (1847)	3·315.		
August ..	5·02 (1845)	2·11 (1854)	3·780.	9·902	
September	5·23 (1847)	0·64 (1843)*	2·807.		18·778
October ..	6·56 (1843)*	1·90 (1842)*	3·340.		
November.	5·58 (1852)	1·60 (1844)	2·879.	8·876	
December.	5·07 (1852)	0·18 (1844)	2·657.		

* The record during 1842-43 was not complete, these years are therefore not used in obtaining the means.

The mean for September is less than that for either August or October; and the same fact is shown even more strikingly in Mr. Hartnup's tables from the Liverpool Observatory, extending over seven years.

Those years are 1846-1852, and if we extract the same years from the Warrington tables we are able to institute a comparison. Assuming that Spring commences on the 1st of March, and the other quarters at regular intervals of three months, we have the following:—

	Warrington.	Liverpool.
Spring (March, April, May)	5·42	4·95
Summer (June, July, August)	10·55	8·35
Autumn (Sept., Oct., Nov.)	9·67	8·92
Winter (Dec., Jan., Feb.)	7·98	6·16
	33·62	28·38

This is interesting in so far as it shows the range of maxima and minima, and the times of their occurrence; but it cannot be regarded as a correct comparison of the total rain-fall at the two places. For this purpose the gauges ought to be at the same elevation above the ground, or their difference of elevation should be known, and accurate allowance made for it. The position of the Liverpool gauge is unfortunate in this respect, being such as to isolate the results obtained by it from other observations. The probability is that the true rain-fall at Liverpool is rather *greater* than that at Warrington.

25*th January*, 1855. MISCELLANEOUS MEETING.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations were laid upon the table:—

From the Ethnological Society of London. Transactions of the Society, volume iii. for 1854.

From the Author, John Gray Bell, Esq. A Genealogical Account of the descendants of John of Gaunt, Duke of Lancaster and King of Castile; illustrated with portraits and armorial bearings of the family of Bell, fol. pamph., 1854.

From the Author, Joseph Boult, Esq. Seven Letters on the Estuary of the Mersey, pamph., 1854-55.

From the Author, Rev. John Sansom, B.A. Esther: a Sacred Drama, 16mo., Oxford, 1845.

From the Author, Thomas Sansom, Esq. A Letter to the Right Hon. Sir Robert Peel, Bart., on the Education of the Middle Classes, pamph. 8vo., 1845.

Mr. Mayer exhibited three numbers of the "Miscellanea Graphica:" a work descriptive of the collection in the possession of Lord Londesborough.

Mr. Mayer also exhibited eight etchings of objects now in his own possession. They represent part of a collection of earthen vases, flint arrow heads, &c., recently found in the barrows or tumuli of Danby Moor, near Whitby, in Yorkshire. The etchings also contained representations of a small comb made of flint, a bone hair pin, stone hammers, &c.

In illustration of her communication, Miss ffarrington, of Worden Hall, forwarded five original drawings, viz.:—1. Elevation of Leyland Church, which was taken down in 1816. 2. Gargoyles from the old Church. 3. Incised slabs and other stones, part of a still earlier building. 4. 5. Incised slabs in the present Church yard of Leyland.

Dr. Hume drew attention to the lithographed statement of the Building Surveyor, respecting the buildings erected, altered, or taken down in Liverpool, in 1854. The annual rate of increase in the population was inferred from it to be 6,029.

Dr. Hume read a popular ballad, descriptive of the naval battle of Port Royal, in 1782, in which Rodney conquered De Grasse. Some of the topics of the present day authorised an allusion to the tactics then adopted, of cutting the enemy's line in two. The suggestion, though claimed by three persons, was generally attributed to Mr. Clarke, of Eldin, father of Lord Eldin, the Scottish Judge; but it appears that it was not unknown to the ancients.

The following Paper was then read:—

NOTES ON THE OLD CHURCH AT LEYLAND. *By Miss ffarrington.*

I take the liberty of sending to the Historic Society some drawings connected with Leyland Church.

The first is the copy of an elevation, taken by some inferior Architect, just before the body of the Old Church was pulled down in 1816, and merely of value as being the only known representation of it as it then stood. It shows the porch, and the curious projecting line of Gargoyles placed at some distance below the roof, but we can gather from it very little respecting the true character of the three larger windows. The Church had a good waggon roof, painted blue, and dotted over with gilt stars. There was a western gallery, erected for the organ, in the early part of George the Third's reign; another and older one along the north wall, and one stretching from north to south across the Chancel Arch, which from its being only wide enough for one row of pews, and from its situation, must, I fancy, have been a "rood loft." The pulpit and desk were near the middle of the south wall.

I have given many of the Gargoyles in another drawing; they were sold as old materials, and my father bought them. The first is "the Cat Stone," to which appends

the usual story of the stones being removed by night (in this case from Whittle to Leyland), and the Devil, in the form of a cat, "throttling" a person who was bold enough to watch.

The tower and chancel were not touched, but the width of the body of the Church was increased nine feet on each side. When the old walls were pulled down, they were no further interfered with than the flooring of the new Church required; but some alterations in ffarington Chapel (which occupies the south east corner of the Church) a year or two since, and which necessitated the entire removal of the old foundations, brought to light the fact that they were partly composed of the fragments of a still earlier Church. The incised slabs drawn out are of very superior workmanship to those in the Churchyard, and the small headstone apparently more ancient. There were other portions of stone coffins besides the head piece I have drawn, and the stones from the Norman arch are in number respectively 11, 5, and 1. There seems no reason to doubt that the undisturbed portion of the foundations would be equally rich in fragments as this south east corner.

The two remaining sheets represent stones now in the Churchyard. There are some others, but I have drawn all or most of the different types. Some of them are defaced by inscriptions of the 17th and 18th centuries; but these, of course, I have omitted in the sketches.

The ffarrington Chapel had a window (and not a door as now) at its east end. I am unable to say when it was first appropriated as a chantry, all my documents on the subject recognising it as already such. You are no doubt aware that a list of the Lancashire Chantries is a desideratum among antiquaries. It is dedicated to St. Nicholas, the Church itself to St. Andrew. In 1591 William ffarrington obtained a confirmation of his previous family claim to it from Bishop Chaderton, who confirms to him and his heirs for ever, a right to "sit, stand, and otherwise repose themselves therein" while living, and after death to occupy "two several vawtes or toumbes in the upper of the same lying eastward to bury the deade bodys of the men, and in the lower standing westward to bury the deade bodys of the women." There was a division between the two sexes in the family pew itself till 1816, and at the present time the men's free sittings run along the south side of the Church, and the women's the north. Prior to the alterations, all that part of the Chapel wall not occupied by monuments was covered with hatchments, helmets, tabards, and other relics of the age of heraldic funerals, but they were destroyed with the old Church. This was unfortunately pulled down at a time when church architecture was little thought of, and the restoration committed to an inferior hand named Longworth. The steeple, which contains six good bells, and the whole of the chancel were undisturbed.

There are three sedilia and a double piscina under four semi-circular arches, and in the opposite wall an ambry, with a small pointed arched door of rude oak as black as ink, till lately painted over. The roll moulding is the characteristic ornament of this part of the Church, and the windows are the simplest form of decorative. There are some fragments of old stained glass in the east one. In the window seat of that westward of the chancel door four folios are chained, viz.: Foxe's "Martyrs," and Jewell's "Apology," in black letter, and "A Preservative against Popery," of later date. From the apex of the chancel arch there hung, till a year or two since, the once sky-blue flag of the Leyland Volunteers, with a wreath of laurel painted on one side, and Britannia, copied from a halfpenny, on the other. I can give no particulars of the corps itself.

In the outer north wall of the chancel, about three feet above the ground, is a low arch, the purpose of which is not very clear. It is, perhaps, four feet wide, and nearly two high in front, and there are no indications of its ever having contained a recumbent figure.

We had a venerable yew tree in our Churchyard, but it was blown down in the storm of Christmas, 1852.

I have only examined the Registers with reference to my own family, but I never met with anything remarkable. Baines gives some account of them, but he does not mention anything curious.

1st *February*, 1855. ARCHÆOLOGICAL SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. Henry George Rimmer, of 6, Breckfield Road South, was duly elected an Ordinary Member of the Society.

Mr. Joseph Clarke, F.S.A., of Saffron Walden, was duly elected an Honorary Member.

The following Donations were laid upon the table: —

From the Kilkenny Archæological Society. Proceedings and transactions for 1854, in three parts, viz.: Part 1 for January, March, and May; Part 2 for July; and Part 3 for November.

From J. F. Marsh, Esq. The following collection of Maps of Liverpool:—that of 1725, Sherwood, given on the margin of his maps of 1821 and 1824; 1765, Eyes; 1769, Perry, in four sheets; 1785, Eyes; 1795, O'Connor; 1796, Conder, published by Gore; 1797, Jones; 1803, Gregory; 1807, Troughton; 1807, Kaye; 1814, Gore; in 1815, Kaye; 1821, Sherwood; 1823, Walkers; 1824, Sherwood; 1838, Austen, published by Kaye; and one, of the south side of the town, 1800, without a name.

From John Mather, Esq. Notes and Queries, five volumes; Memoirs of Captain Crow, of Liverpool, 8vo., 1830. Plan and Elevation of India Buildings, Water Street, by Maclure & Co.; Account of the visit of the Prince of Wales in 1806, a broadside, by Gore; Map of Lancashire, by James Leigh, showing all the Roman Catholic Chapels in the County in 1820.

From David Lamb, Esq. The *Athenæum* for 1854, in continuation of a former donation.*

From the Rev. Dr. Thom. Anthem and Epitaphs in Memory of certain of his deceased kindred. By Thomas Macgill, Percy Street, Liverpool, 1854.

From Henry Johnson, Esq. A Roman Mortarium, found at Castle Northwich. On the rim is the maker's name SOLVSF (Solus fecit).

Dr. Kendrick exhibited a portrait of Dr. Aikin, within the frame of which was part of a note from Miss Lucy Aikin, dated 28th January, 1854, expressing her conviction of its correctness.

Dr. Kendrick also exhibited, in illustration of his own paper, a woodcut of a summer-house, and eight lithographic representations of buildings, entitled, "Warrington Vestigia Academica."

Mr. Hardman exhibited two brass rubbings from Dartford in Kent, of the dates 1442 and 1453 respectively.

The Secretary was directed to subscribe for the following works, to be added to the Library of the Society:—

La Normandie Souterraine, ou Notices sur des Cimitières Romains, et des Cimitières Francs, explores en Normandie. Par M. L'Abbé Cochet.

Anglo-Saxon Antiquities, being the unpublished Account, by the Rev. Bryan Faussett, of the Collection now in the possession of Mr. Mayer, procured in the exploration of more than five hundred Anglo-Saxon tumuli in Kent. To be edited by Charles Roach Smith, F.S.A.

The Preston Guild Rolls, illustrated biographically, and with portraits, costumes, and fac-similes.

The following Papers were then read:—

A Morning Ramble through Old Warrington, by James Kendrick, M.D.; and Description of a Unique Vase in the possession of Mr. Mayer, by F. R. P. Böcke, Esq.

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* Vol. vi., p. 2.

8th February, 1855. LITERARY SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations were laid upon the table:—

From the Norfolk and Norwich Archæological Society. Original Papers published under the direction of the Committee, vol. iv, part 3, 1855.

From the Statistical Society. Journal of the Society. Parts 1, 2, and 3 of vol. xvii. (1854.)

From James Gordon Stewart, Esq. Liverpool Churches and Chapels, their destruction, removal, or alteration, with notices of Clergymen, Ministers and others. By the Rev. Dr. Thom. Reprinted with additions and alterations from the papers of the Historic Society. 1854.

From the Rev. Dr. Thom. The Ultimate Manifestation of God to the World. By David Waldie, Esq., 1847.

Mr. Hardman exhibited a copy of the Bible in Spanish, (Basle, 1569,) with curious MS. notes.

The Secretary laid upon the table the first five volumes of the Journal of the Statistical Society, now out of print. They had been purchased by the Council to complete the set.

The following communication was read:—

NOTICE OF AN ANCIENT MANUSCRIPT CHRONICLE. *By the Rev. John Sansom, B.A., Oxford.*

I have had put into my hands and have now before me, the unpublished manuscript of an ancient English Chronicle, a brief notice of which may perhaps be acceptable to the members of the Historic Society.

This MS is contained in a folio volume of 452 pages, written on parchment in a legible black letter of the simplest character, with illuminated capitals at the beginning of the several chapters, the headings of which are in red ink, as are also some quotations occurring here and there throughout the history.

From the account given of this interesting volume by the Rev. J. S. Davies, of Pembroke College, Oxford, by whose kindness I have been entrusted with it, it appears to have been handed down in the family from time immemorial, together with certain printed books known to have belonged to the historian Speed, from whom Mr. Davies's family claim descent. Thus it is not unreasonably conjectured, that the MS may also have belonged to Speed: a supposition, however, which had met with no conclusive corroboration up to Thursday last, February 1. Previously to that date, Mr. Davies had made a careful comparison of his MS with divers published Chronicles; by which means he thinks he has ascertained, that certain minor conversations and historical fables of greater or less interest, which are found interspersed here and there throughout the volume, do not meet with any mention at the corresponding places in such of the Ancient Chronicles as he had been enabled to search. It seemed, therefore, reasonable to conclude, even prior to any distinct clue being found to the authorship or original ownership of this nameless MS, that it was not a mere copy or translation of some other, but an independent and original work. This conclusion, as well as the fact of the volume having been in Speed's possession, may be now considered as satisfactorily established.

On Thursday, Mr. Davies accompanied me through the pages of Speed's History of Great Britain; where, in the course of our search, we detected *one undoubted extract* from this MS Chronicle, besides other references made to it with sufficient closeness and accuracy to allow of the passages being traced and collected. The volume is, in truth, no other than the "ancient MS," "nameless old MS," and "English Chronicle MS," to which reference is made several times in the margin of Speed's history.

The solitary extract, which I think conclusive in determining the book's identity, is found in the 7th book of the History of Great Britain, chap. 12, at p. 317 of the first edition, where reference is made in the margin to "a namelesse old MS, chap. 154."

The passage in the text is as follows:—

"Thus in an old manuscript we find it indited: *Understand among you of Rome, that I am king Arthur of Britaine, and freely it hold, and shall hold; and at Rome hastily will I bee, not to give you truage, but to have truage of you: for Constantine, that was Helene's sonne, and other of mine ancestors conquered Rome, and thereof were Emperours; and that they had and held I shall have yourz* [sic!] *Goddis grace.*"

The original passage in the MS, which occurs, *not* at chap. 154, (which is clearly a mistake,) but towards the end of cap. lviij, I will now transcribe literally: "Understondeth among you of Rome yat I am kyng Artur of Britayne and frely it holde and shal holde and at Rome hastly will I be not to geve you truage but forto haue truage of you for *Constantyn* yat was helene's sone and oyr of myn auncestris conquerid Rome and yerof were emperours and yat thay hadde and held I shall haue yorouz goddis grace."

The word "yorouz" in the MS evidently puzzled Speed's printer: but happily the printer's darkness discloses to us, as it were, a star—to be our beacon to the only passage, which the historian appears to have extracted word for word.

There is yet another argument, by which this identity may be corroborated. The writer of that portion of Speed's History, which records the death of King John, mentions certain "*nameless authors before ann.* 1483," and refers in the margin to "*Eng. Chronicles MS*;" whilst it is observable of Mr. Davies's MS, that it ends somewhat abruptly with the close of the reign of king Henry vi; having the appearance of an unfinished work. So that, in all likelihood, the author of this Chronicle flourished in the succeeding reign (viz. that of Ed. iv.) which ended in the year referred to, (i.e. 1483.) It should perhaps be mentioned, that the MS commences by accounting for the name of Albion by the known fable of Albyne and her sisters; and that throughout it seems to contain the usual complement of romantic legends.

As Speed was a Chester man, it seems highly probable, that the Historic Society of Lancashire and Cheshire, or some member, may be in possession of some facts or documents capable of throwing light upon this interesting volume. Should such be the case, not only would it be esteemed a favour by Mr. Davies, and by the writer of this notice, but it might also tend to remove an obscurity in one of the bye-paths of historic literature, if any information that may be possessed might be obligingly communicated.

A Paper was also read, of which the following is an abstract:—

ANALYSIS OF THE SUBSCRIBERS TO THE VARIOUS LIVERPOOL CHARITIES. *By the Rev. A. Hume, D.C.L., LL.D.*

This Analysis was made in imitation of a former one, dated 1852, the intention of which was to shew the subscribers to all the Church objects in town.

The subjects were arranged under four general heads.

1. *Distant Missions:* Including the Church Missionary Society, the Society for the Propagation of the Gospel, and the Colonial Church Society.

2. *Home Missions:* Including the Pastoral Aid, the Curates' Aid, and Church of England Scripture Readers' Societies.

3. *Religious Objects General:* Church building, in connexion with three local societies; and the building of other local churches, in a period of three years.

4. *Educational Objects General:* Building of Church Schools in a period of three years, and permanent support of the Church of England School Society.

The names of all the subscribers were arranged in alphabetical order, and in columns opposite to each name marks were put, indicating the objects to which the individual subscribed.

The general result was the following:—

(1) That there are only 122 gentlemen who subscribe to the majority of these objects, or to any considerable number of them. (2) That the entire strength of their supporters—that is, of those who subscribe to any or to all of them—is 1248. (3) That

690 other persons subscribe to the Blue-coat Hospital, or to the schools connected with the various churches and districts of the town. Several of these last, including a large proportion of those who subscribe to the Blue-coat Hospital, are protestant dissenters.

It is not necessary to discuss the question here, "what are charities?" Some include under the term all societies or institutions whose object is either to promote the glory of God or good will towards men; others apply the term to societies for the latter object merely; while others again, perhaps more logical and consistent than either of the foregoing, confine the term "charities" to such societies or institutions as minister to the relief of human suffering, from which others have nothing to fear. It is obvious that a fever hospital, a lunatic asylum, or a receptacle for persons with malformations, is not a *charity*, except in a very loose sense of the term. It is really an institution connected with moral and sanatory police, having in view prevention as much as cure, perhaps more.

Without adhering rigidly to this distinction, the institutions of which an analysis is given here are the following:—

1. The Blue Coat Hospital.
2. The Northern Hospital.
3. The Southern Hospital.
4. The Liverpool Dispensaries, including St. Anne's Dispensary, and Eye and Ear Institution.
5. The Royal Infirmary, Lunatic Asylum, and Lock Hospital.
6. The Eye and Ear Infirmary.
7. The District Provident Society.
8. The Sailors' Home.
9. The Asylum for Orphan Boys.
10. The Female Orphan Asylum.
11. The School for the Deaf and Dumb.
12. The School for the Blind.

Omitting all other sources of income, such as endowments, houses, invested property, donations, and church collections, let us look to the *annual subscribers* alone. We easily gather from the Reports the following general statement:—

Charities.	Subscribers.	Total Sub'tions. £	Average of Sub'tions. £ s. d.
Blue Coat Hospital	1733	2063	1 3 9
Northern Hospital.....	1263	2034	1 12 2
Southern Hospital	728	1213	1 13 4
Dispensaries	1130	1861	1 12 11
Royal Infirmary, &c.....	1350	2464	1 16 6
Eye and Ear Institution	334	868	1 1 9
District Provident Society ..	637	735	1 3 1
Sailors' Home	167	263	1 11 6
Asylum for Orphan Boys	479	496	1 0 8
Female Orphan Asylum	835	876	1 1 0
Deaf and Dumb Institution ..	429	496	1 3 2
School for the Blind.....	675	812	1 4 1
	9760	13,676	

Thus, speaking in general terms, there are *ten thousand* annual subscriptions paid to the charities of Liverpool, independent of other sums; and these amount to £14,000. The subscriptions to the Infirmary are the largest, probably because it includes several objects; there are a good many of £5 5s. Those to the Asylum for Orphan Boys are the smallest, being usually a guinea or half a guinea.

Now, it must be apparent, that though there are 9760 *subscriptions*, there are not 9760 *subscribers*, but that the name of one individual occurs in several reports. If, therefore, we take the largest list as a basis, the roll of the Blue Coat Hospital, we may compare each of the others with it, and see what proportion of their subscribers is to be found in it. It is popularly said that the subscribers to the Blue Coat Hospital support

all the charities of the town; an analysis of this kind will test the accuracy of the statement.

Of the 1753 subscribers to the Blue Coat Hospital, the following numbers and proportions are found in the several lists:—

	Subs.	Proportion of the whole.
Northern Hospital	629	60 per cent.
Southern Hospital	402	57 „
Dispensaries	615	59 „
Royal Infirmary, &c.	782	58 „
Eye and Ear Institution	194	58 „
District Provident Society	371	58 „
Sailors' Home	105	68 „
Asylum for Orphan Boys	307	64 „
Female Orphan Asylum	478	57 „
Deaf and Dumb Institution	294	69 „
School for the Blind	391	59 „
	4568	

Thus it appears that the subscribers to the Blue Coat Hospital pay from 50 to 70 per cent. of the subscriptions to the other charities mentioned here. Deducting 1733 subscriptions from the total, 9760, we have 8027 as the total subscriptions to the charities on this latter Table. The number 4568 gives an average of 57 per cent.; so that *nearly three-fifths* of the support to all the other charities is given by the subscribers to the Blue Coat Hospital.

The next point was to ascertain how many subscribe to only *one* object, and what that object is. For a variety of reasons, different individuals prefer different charities and patronise them only, while the sympathies of others are more widely extended. To ascertain this, it was necessary to throw the names of all the subscribers into alphabetical order, and to mark opposite to each in prepared columns, the objects to which he subscribed. The subscribers to only one object were then apparent, in the respective columns.

	Subscribe to only one object.	Proportion of the whole.
Blue Coat Hospital	493	28 per cent.
Northern Hospital	258	20 „
Southern Hospital	125	17 „
Dispensaries	135	12 „
Royal Infirmary, &c.	144	11 „
Eye and Ear Institution	39	12 „
District Provident Society	81	13 „
Sailors' Home	21	13 „
Asylum for Orphan Boys	26	5 „
Female Orphan Asylum	104	12 „
Deaf and Dumb Institution	13	3 „
School for the Blind	89	13 „
	1527	

It thus appears that from 15 to 16 per cent. of all the subscriptions are given by persons who subscribe to "pet charities" only; while the remaining 84 per cent. are contributed by persons whose benevolence is of a more diffusive character. But what proportion do these 1527 single-charity subscribers bear to the whole? A careful summing give us 3448 as the entire number of the names; so that *of those who subscribe to the Liverpool charities, 44 per cent. subscribe only to one object.* There are, of course, 56 per cent. who subscribe to more objects than one.

It is still further desirable to show how many subscribe to two, three, four or more objects, and how many to the whole. With some trouble, the whole of these facts may be gleaned from the combined list; and they form important data for further deductions.

			Subscriptions.
Subscribe to only one object	1527	making	1527
„ two	649	„	1298
„ three	344	„	1036
„ four	259	„	1080
„ five	198	„	990
„ six	135	„	810
„ seven	108	„	756
„ eight.....	85	„	680
„ nine	60	„	540
„ ten	43	„	430
„ eleven	30	„	330
„ twelve	10	„	120
	3448		9549

This table furnishes us with some very important results.

Looking primarily to the *subscriptions*, and only secondarily to the *subscribers*, the following curious results appear:—

(1) If to those who subscribe to five or more objects we add 30 of those who subscribe to four, we have 689 individuals contributing 4776 annual subscriptions, while the remaining 2749 individuals contribute only 4773. In other words, *half the support to the public charities of Liverpool is given by 689 individuals!*

(2) Again, let us add together those who subscribe to four or more objects and 225 of those who subscribe to only three. The result is that 1173 individuals contribute 6367 subscriptions, while the remaining 2295 contribute only 3182. In other words, *two thirds* of the support given to the public charities of the town is by 1173 individuals, while *nearly twice the number of persons are required to supply the remaining one-third!*

(3) We are now in a position to test the correctness of the popular statement that "about 1500 persons support all the charities of the town." Let us add 421 of those who subscribe to two objects to the 1527 who subscribe to only one object. The whole subscribers are then divided into two sets of 1948 and 1500 respectively. The former contribute only 2369 annual subscriptions, or less than 24 per cent. of the whole; the latter (1500 persons) contribute 7280 annual subscriptions, or more than 76 per cent. of the whole. The popular statement is therefore verified in its substance: 1500 *individuals do actually contribute more than three-fourths of the support which our local charities receive.*

(4) Finally, if we add together the subscribers to more than one object, we have 1921 individuals contributing 8122 subscriptions (an average of 4¼ each), while 1527 others contribute only 1527 subscriptions.

The concluding part of the paper was occupied with suggestions for the amendment of this state of things.

Thus, there were in Liverpool, in 1853, 65,442 persons rated to the poor. Admitting that a good many of these are themselves poor, and the recipients of relief, there is still a large number who ought to subscribe, but actually give nothing for public purposes. If we omit those who are rated under £12 a year, 34,520, we have still 30,922 heads of families, each of whom ought to contribute something.

The plan of seeking for numerous subscriptions, even though they should be smaller than at present, was strongly recommended, on the ground that it would interest a much larger number of persons in those benevolent objects.

The publication also of a combined list, similar to that of the subscribers to Church objects, or to that from which the last two of these tables were compiled, would obviate numerous difficulties. It would show, (by the absence of their names,) all those who neglect this part of their moral obligations; and these would be the persons to be canvassed, instead of those who give already. But even those whom such a list would show to be subscribers, might become more thoroughly so. Persons who now subscribe to only one object, might be induced to subscribe to two; those who subscribe to two,

might extend their aid to three or four; and so on. The chief advantage, however would be, the continual enrolling of new contributors through the exertions of canvassers, until nearly all who pay income tax would also pay a voluntary taxation to diminish those evils to which humanity is liable, and for which in this country there is no legal provision.

15*th February*, 1855. SCIENTIFIC SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations were laid upon the table:—

From the Architectural, Archæological and Historic Society of Chester. Proceedings and Papers, part iii. January to December, 1852.

From the Author, James Stonehouse, Esq. A New and Complete Hand-book for the Stranger in Liverpool, 12mo. Lacey.

Dr. Hume exhibited and explained his Combined List of the Subscribers to all the Church objects in the town. It was arranged alphabetically with the addresses, and showed the particular Societies and Institutions to which each gentleman subscribed. It was on the same plan as the Combined List which he had recommended, of the Subscribers to the various Charities of the town.

Mr. Stonehouse exhibited a set of Wedgewood's Cameos, twenty-five in number, systematically arranged.

The following Paper was then read:—

On the Manufacture of Cobalt, by Henry Atherton, Esq.

22*nd February*, 1855. MISCELLANEOUS MEETING.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations were laid upon the table:—

From Edward Hindley, Esq. Chaucer's Works in black letter, with large coloured wood-cuts. Folio. London, 1562. Spencer's Faery Queene and other Poems, 4to. London, 1612.

From J. Norman Crosse, F.S.S. The early Naval Ballads of England, by J. O. Halliwell, F.R.S., (No. viii of the Tracts issued by the Percy Society of London,) 1841.

Jack of Dover, his Quest of inquiry for the Veriest Fool in England, (No. xxvi of Ditto,) 1842.

Thirteen Psalms, and the first Chapter of Ecclesiastes, translated into English verse, by John Croke, Temp. Henry viii, (No. xl of Do.) 1844.

St. Brandan, a mediæval Legend of the Sea; by Thomas Wright, M.A., F.S.A., (No. xlviii of Do.) 1844.

From the Author, Robert Rawlinson, Esq., Report of the General Board of Health, on a Preliminary Inquiry respecting Middleton in Lancashire, 1854.

From the Editor, J. F. Marsh, Esq. Papers connected with Milton and his Family. Issued by the Chetham Society, 1851.

La Normandie Souterraine, by the Abbé Cochet, which had been procured for the Society, was laid upon the table for the inspection of the members.

Dr. Hume exhibited a section from a branch of the Phytolacca or "Ombro" of the Spaniards. It had been cut in the Botanic Garden of Liverpool in 1851, and exhibited

no fewer than seventeen rings, though it was only three years since the branch had first appeared on the trunk. It would deceive the inexperienced respecting the age of the tree.

Dr. Hume also exhibited the leg of an Australian Emu, *Dromaios ater*, showing how the tibia was serrated behind; also the skin of the foot of an Albatross, *Diomedea exulans*, which had been used as a purse by a New Zealand chief.

The Chairman exhibited a portrait of the late Stephenson Macgill, D.D., engraved from a painting by Raeburn.

The Rev. P. S. Dale exhibited two printed lists of toasts, each consisting of 44 in number. Those in one, were proposed at a banquet held in the Town Hall, in December, 1813, on the occasion of a public rejoicing after the battle of Leipsic, the room being used for the first time, and the building still in an unfinished state. This was accompanied by an engraving, showing the appearance of the Hall when illuminated on the occasion. Those in the other list were proposed at a dinner held in January, 1814, at the King's Arms, Castle Street, in honour of the Right Hon. George Canning, who then met his constituents.

The Secretary read two resolutions adopted by the Council, showing their earnest desire to put the Library in order as soon as possible, to secure a suitable place of deposit for it, and to make its contents available to the members.

Mr. Stonehouse read a short communication entitled Hard Winters, enumerating and describing the periods of greatest severity, from 1585 to 1838.

Dr. Hume read some extracts from a manuscript glossary of the native language of Australia. It was compiled about 1846, by George H. Barber, Esq., a native colonist, from the tribe which inhabits the valley of the Hume river or Upper Murray.

A member read an account of one of the Summer excursions of the Berwickshire Naturalists' Club, written by a lady. The visit was to Etall on the Border, and the surrounding neighbourhood.

Mr. Marsh exhibited five portraits of Milton, and an impression of a silver seal supposed to have belonged to him.

The following communication was then read:—

NOTICE OF THE INVENTORY OF THE EFFECTS OF MRS. MILTON, WIDOW OF THE POET. *By J. F. Marsh, Esq.*

Mr. Marsh exhibited a copy of the inventory, filed in the episcopal registry of Chester, of the effects of Mrs. Milton, the widow of the poet. The copy had been furnished to him by the courtesy of Mr. Jones, of Nantwich, whose search had brought the document to light, and who had communicated the fact in an article which appeared in "Notes and Queries" of the 10th instant. His forwarding a copy of this very curious document was one of those "Amenities of Literature" which every one who cultivates a literary taste has had opportunities of experiencing, as he was a total stranger to Mr. Marsh, and knew him only from the fact that a few years ago the accident of his being the possessor of some original documents connected with the affairs of the poet's family had led to his editing them as a contribution to the miscellaneous volume of the Chetham Society. Those documents consisted of the releases from Milton's three daughters to his widow for their portions of their father's estate, various documents showing the family relations and pecuniary circumstances of the widow, and, finally, the probate copy of her will, dated 22nd August, 1727, and proved on the 10th of October following. He had taken the opportunity of appending some observations, in which he had succeeded in exploding some long standing errors as to the parentage* of Milton's widow, vindicating her from some unjust reflections on her character, and on her conduct to her husband's children; and, finally, after

*It has been repeatedly stated, on the authority of Ormerod, who had been misled by a mistake of Pennant, that she was the daughter of Sir Edward Minshull, of Stoke; but it is now unquestionably shown that she was the daughter of Randulph Minshull, of Wistaston, near Nantwich, where she was baptized on the 30th December, 1638, and, consequently, if baptized shortly after birth, she was in her 26th year at the time of her marriage with Milton in 1664, and in her 89th at her death.

tracing her pedigree, shewed that she died at Nantwich, at the date above indicated, leaving effects sworn under the value of £40, her income having been derived from sources which terminated with her life.

The law requires that executors and administrators shall lodge in the Ecclesiastical court an inventory of the deceased's effects. In modern times this is never done, except in cases of litigation, and the words—"time being allowed to exhibit an inventory" have become a mere form. Not being aware that the practice of lodging an inventory, as a matter of course, had prevailed so late as 1727, he had not thought of searching for one. Mr. Jones had, however, done so, and had succeeded in bringing to light a document describing with great particularity a number of articles, several of which it would be curious to trace.

A "Totershell knife and fork," valued, with other odd ones, at 1s.," Mr. Jones promised to make the subject of a further communication to "Notes and Queries."

"Mr. Milton's pictures," valued, along with his coat of arms, at £10 10s., describes two portraits of the poet which are well known, and the fact that one of them had been sold by Mrs. Milton's executors for twenty guineas had been noticed in the Chetham Tract, in support of the inference that the £40, under which her effects were sworn, was the mere nominal amount of an appraiser's estimate. The pictures are thus referred to, in a note to Warton's "Minor Poems of Milton:"—

"There are four or five original pictures of our author. The first, a half length with a laced ruff, is by Cornelius Jansen, in 1618, when he was only a boy of ten years old. It had belonged to Milton's widow, his third wife, who lived in Cheshire. This was in the possession of Mr. Thomas Hollis, having been purchased at Mr. Charles Stanhope's sale for thirty-one guineas, in June, 1760. Lord Harrington wishing to have the lot returned, Mr. Hollis replied that his lordship's whole estate should not re-purchase it. It was engraved by J. B. Cipriani in 1760. Mr. Stanhope bought it of the executors of Milton's widow for twenty guineas. The late Mr. Hollis, when his lodgings in Covent Garden were on fire, walked calmly out of the house with this picture by Jansen in his hand, neglecting to secure any other portable article of value. * * * Another, which had also belonged to Milton's widow, is in the possession of the Onslow family. This, which is not at all like Faithorne's crayon drawing, and by some is suspected not to be a portrait of Milton, has been more than once engraved by Vertue, who, in his first plate of it, dated 1731, and in others, makes the age 21. This has been also engraved by Houbraken, in 1741, and by Cipriani.* The ruff is much in the neat style of painting ruffs about and before 1628. The picture is handsomer than the engravings. This portrait is mentioned in Aubrey's MS Life of Milton, 1681, as then belonging to the widow, and he says: '*Mem.—Write his name in red letters on his pictures, which his widowe has, to preserve them.*'"

There was another item deserving particular notice, namely:—

"2 Teaspoons and one silver spoon with *a seal* and stopper and bitts of silver.. 12/6"

The silver seal could not be so satisfactorily traced as the pictures, but in the 6th vol. of the Archæological Journal, a silver seal of the poet was mentioned as having been exhibited at one of the meetings of the Institute, by Mr. Disney, and the account goes on to state that "this valuable memorial had been in the possession of Mr. John Payne, on the death of Thomas Foster, who had married Elizabeth Clarke, daughter of Deborah, Milton's youngest daughter, and wife of Abraham Clarke, a weaver in Spitalfields. Mr. Payne sold it to Mr. Thomas Hollis in 1761. On his death, 1774, it came into the possession of Mr. Thomas Brand Hollis, and then became part of the collection inherited in 1804 by Dr. Disney." Now if this history of Mr. Disney's seal be strictly correct, it could scarcely have been the same described in Mrs. Milton's inventory, which was taken the very day before the death of Deborah Clarke, and none of Mrs. Milton's property was likely to have got into the possession of the Fosters; but without detracting at all from the authenticity of Mr. Disney's relic, which speaks for itself, it may be conjectured that its early history may have been misrepresented by Mr. Payne, or a previous owner. This is, perhaps, preferable to the supposition of there having been a second silver seal in Mrs. Milton's possession.

* All the engraved portraits mentioned above, namely, the two by Cipriani, one by Vertue, one by Houbraken, and one by Faithorne, were exhibited to the meeting.

The supposition that the £40 was a mere appraiser's estimate, at a nominal value, is quite refuted by an inspection of the inventory. On the contrary, the articles are enumerated with extreme minuteness, as, for instance, "2 pewter spoons, 3d.;" "1 roll pin, 1d.;" "Coles, 6d." In fact, out of 108 items, embracing a larger number of separate articles, 36 items are under one shilling, 46 others under five shillings, and only three above one pound. The three first items of the inventory being, with the exception of "1 pair, 1 odd sheet, 14s." and "1 old pair of sheets, 2s.," the only bedding described, would indicate extremely straitened means. They consist of "a pair bedstead and hangings, 18s.;" "a feather bed and bolster, weight 94l., at 6d., £2 7s.;" "2 quilts and pair of blankets, old patched ones, 10s.;" and when they come to be compared with the prices put upon various articles of wearing apparel, such as "a Norwich gown and petticoat, £1 5s.," "a Calmiancoe gown, 14s.," "a quilted petticoat, 8s.," and "an old Norwich gown and coat, 10s.," it would seem that a fair price was put upon the articles. At the same time, a certain degree of gentility is indicated by several of the items, such as the various articles of wearing apparel, and even the trifling items of—"1 old muff and case, 4d.," and "2 pair ruffles, 2s." "1 dress-box, bottles and things belonging, 12s.," are quite in keeping, while "1 mask and fan, 2s." are articles we should scarcely have expected to find among the goods and chattels of Mrs. Milton.

The entire document, irrespective of the interest felt in the individual to whom it relates, gives a curious picture of the household arrangements of a lady of straitened means at the commencement of the last century, and accords well with a saying which a Nantwich correspondent states, on the authority of a lady of 88, to have been formerly in use in that neighbourhood, of persons who had narrow incomes—that they had "Mrs. Milton's feast—enough and no more."

The following is a copy of the

"TRUE AND PERFECT INVENTORY

of the goods and chattels of late Mrs. Elizabeth Milton, appraised by us, whose names are underwritten, this 26th of August, 1727."

A pair Bedsteads and hangings	0	18	0
A feather bed and bolster, weight 94l. at 6d.	2	7	0
2 Quilts and pair of Blanketts, old patched ones	0	10	0
2 Teaspoons and 1 silver spoon with a seal and stopper and bitts of silver	0	12	6
1 Chest of Drawers and frame	0	13	0
1 Dress-Box, bottles, and things belonging	0	12	0
1 Pencil case	0	3	0
1 pr 1 odd sheet	0	14	0
1 doz. old napkins	0	4	0
6 old peices of linnen	0	2	0
8 Pewter plates	0	6	0
2 Pewter Dishes	0	4	8
2 Do.	0	3	0
A small Brass Mortar and Pestill	0	2	0
A Coffee Copper Pot	0	3	0
A Brass Fender	0	1	4
2 Kettles and 3 old sospans at 9 p. with old stewpan	0	6	9
1 Pewter Pint	0	0	8
1 Small Hang Iron	0	0	8
2 Small Hang Spits	0	0	4
Iron Scewers and Egg slice	0	0	4
Iron and heaters	0	2	0
Iron Pestill and wood mortar	0	1	0
1 fire shovell, tongs, and proker	0	1	8
1 Flesh fork	0	0	4
A Marble Mortar and Pestill	0	0	6

2 Cane Chairs and two velvet cushins	0	17	0
1 Small Cover'd Chair	0	2	0
1 Joyn stool	0	1	0
1 large old trunk and frame	0	6	0
1 Hair trunk	0	8	0
2 Dale Boxes	0	2	0
1 Leather Trunk	0	1	0
1 Small cover'd box	0	2	0
1 old dripping pan	0	0	4
1 old muff and case	0	0	4
1 old shash	0	0	6
3 Sedge bottom chairs	0	1	6
A Tin fish plate	0	0	6
A Hand Candlestick and snuffer of Tin	0	0	6
A Tin do.	0	0	3
A Large Bible	0	8	0
2 Books of Paradise	0	10	0
Some old Books and few old pictures	0	12	0
Mr. Milton's pictures and Coat of Arms	10	10	0
2 Pails, 1 stand, 2 small barrells	0	5	0
2 doz. glass bottles	0	4	0
1 pair of bellows	0	0	9
White ware and Earth ware	0	6	0
1 old chaff dish	0	0	6
2 Steans and Black Jug	0	1	0
1 Roll Pin	0	0	1
1 old square table	0	1	0
1 Stand	0	0	10
2 Old Maids	0	0	9
1 Tin Coffee pot	0	0	8
1 Iron Twitch Candlestick	0	0	3
2 Pewter spoons	0	0	3
A Totershell knife and fork with other odd ones	0	1	0
2 old pr siserrs	0	0	3
1 old looking glass	0	1	6
Tobacco box	0	0	6
2 old cushions	0	2	0
1 Pillow	0	2	6
6 Petty pans and bottoms	0	0	9
Black and white Gown and Pettycoat	0	5	0
A little table	0	2	0
A Fine cloak and hood	0	17	6
A Norwich Gown and Petticoat	1	5	0
A Calmiancoe Gown	0	14	0
A Quilted Petticoat	0	8	0
An old Norwich gown and Coat	0	10	0
An old blew shagg Coat	0	1	0
1 short black hood	0	1	0
2 Silk handkerchiefs	0	5	0
An old Sasnett hood	0	1	0
1 old handkerchief	0	0	6
1 short black hood more	0	1	0
1 long do.	0	2	0
2 silk aprons	0	2	0
1 Mask and Fan	0	2	0
3 pr of old Gloves	0	1	0
The best suit of twad cloaths	0	3	0
The worser do.	0	1	6

2 pair ruffles	0	2	0
1 Muslin hood	0	0	6
A Muslin Apron	0	1	6
A handkerchief	0	0	6
A Cambrick do	0	2	0
A Scotch do	0	0	10
3 pair of sleeves	0	0	6
8 old Double cloaths	0	0	4
A White Hood	0	0	8
A White do. and Sleeves	0	0	8
3 White old Aprons	0	2	0
3 Course Shifts	0	3	0
Windo and Ragg'd Curtains	0	1	0
2 Pocketts	0	0	8
3 old Check Aprons	0	1	0
A pair shoes and two pair clogge	0	2	6
1 old pair of sheets	0	2	0
4 pr of brass weights	0	0	6
2 pr of Spectables	0	1	6
In Money	0	17	0
1 Chop block	0	0	4
Coles	0	0	6
2 small rods	0	0	6
1 Shift and old bits of linnen	0	2	6
	£38	8	4

John Wright
John Allcock.

Mr. Benn forwarded for exhibition, a curious spear head; a portion of a stone mould for bronze objects; a triangular crucible, perfect, and another imperfect; a stone or slag crucible, perfect, and another imperfect. The following communication was then read:—

NOTES ON THE PRIMITIVE INHABITANTS OF GREAT BRITAIN AND IRELAND. *By Edward Benn, Esq.*

I have read with great pleasure and instruction the report of the very interesting matters discussed by Mr. Wright, at the late meeting of the British Association in Liverpool. But while admitting the great talent and extensive information of Mr. Wright, I must dissent from some of his views on Irish antiquities. Thus, he expresses an opinion that stone hatchets have been used for striking fire. They do not appear to have been generally used for such a purpose, or indeed to be suited to it. I have examined hundreds of them, and never perceived any marks or chipping, such as might be presumed to arise from frequently striking fire. But I have met with many which were broken, as if by the effect of a violent blow, such as would be given in using the instrument for splitting wood, or the other general purposes, in which, it might be supposed, the tool of all work of a very rude people might be employed. Besides, I may mention that as a general rule, they are made of such stone as would not strike fire, nor do I see how they could be made to produce fire by friction.

The second statement from which I must dissent, is, that the well-known bronze sword found over a great part of Europe, was manufactured by the Romans, and sold as an article of commerce. This, I think, is not correct, so far as Ireland is concerned. In that country two kinds of swords are found, the flag-shaped sword alluded to by Mr. Wright, and the small sword. The former does not appear to have been a good weapon; very few are so heavy that they could be used with effect as broad swords, and their breadth near the point would appear to have rendered them equally unsuitable for stabbing purposes; but the small sword, which is more common, was a most effective weapon. It is shorter than the other, but this was remedied by lengthening the handle, no fixed

place being left for it as in the other kind of sword. The handle may have been of wood, to suit the taste or convenience of the owner, and the rivets by which it was fixed are still very generally found attached. I think there is good reason to believe that these swords at least were of Irish manufacture, for if it can be shown that brass castings were made there, at a time as remote as the period at which brass swords were used, with such extraordinary skill as to astonish and puzzle the best brass founders of the present day, we may well suppose that swords of much more simple workmanship were also made. The brass spear which I exhibit is an example of great skill in brass casting; and in proof of my opinion that such instruments were made in Ireland, I produce a mould found in that country, that had been used, without any doubt, for the casting of spears. This mould is incomplete, having been injured and rejected perhaps. It is made of what I believe is called soap stone. It is so soft as to be capable of being cut with a knife, though it retains its sharpness, is very durable, and seems every way well adapted for the purpose intended.

I also exhibit a perfect crucible, and parts of two others that appear to have been burnt out. These articles are perhaps *unique*; their date is unknown, but they were found in the north of Ireland, under circumstances that would lead to the inference that they belonged to the Saxon period, or to an era about 1,000 years distant. Of course they are not probably so old as the spear, or swords, or mould, but they are still very curious. Indeed, the every day tools and domestic articles of our ancestors are more interesting and give us better ideas of their state of civilization, than their warlike weapons and personal ornaments.

1*st March*, 1855. ARCHÆOLOGICAL SECTION.

THOMAS AVISON, Esq., F.S.A., Treasurer, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. John Norman Crosse, F.S.S., of 6, Sweeting-street, was duly elected a member of the Society.

The following Donations were laid upon the table:—

From the Societé Archæologique d' Orleans. Bulletin de la Societé, No. xix, being part 4 for 1854.

From Samuel Gath, Esq. Account of the Northern Bar, to the year 1833. Lithographed in fac. sim. of the handwriting of the compiler, the late Fletcher Raincock, Esq.

From James Boardman, Esq. Report of the Liverpool Sailors' Home, Registry, and Savings Bank, for the year 1854.

From John N. Crosse, F.S.S. A Padlock manufactured and used at Braga, in Portugal.

The first number of the Archæological Mine, including a new History of Kent, by Alfred John Dunkin, Esq., was laid upon the table. It is received in exchange for the Society's publications.

Mr. Mayer forwarded for exhibition three Danish "prim-staves" or "Runic calendars," two of which are his own, and one belongs to the Society. They were intended to illustrate one of the papers to be read.

Mr. Crosse exhibited a copy of Barker's edition of the Book of Common Prayer, A.D., 1635, with which was bound up the Psalms by Sternhold and Hopkins, with music, 1632. Mr. Crosse also exhibited a book of proof engravings, of some persons and scenes during the reigns of Charles I and II; a curious contemporary print of the trial of Charles I; and the Raven Almanack, 1677.

Mr. Johnson exhibited a copy of the Goldsmith's Almanack, also of 1677; and a volume bound in vellum, containing a description of Palmistry, Virgil's Eclogues, and an Ecclesiastical Calendar for 1475, 1494, and 1513.

Mr. Jacob exhibited a copy of Cocker's arithmetic of the date 1708.

In conformity with Law xvi, the Treasurer exhibited the official List of the Members showing all the payments made.

The Secretary read an extract from a French newspaper, *Le Pilote de la Somme* of 23rd September, 1854, announcing the successful researches of M. Boucher de Perthes, respecting the objects of the "stone period." His travels had been during the spring and summer of 1854, in the North of Europe, as in 1853 they had been in the East.

The following Papers were then read :—

Some sections of Mr. Worsaae's recent work, "Sketches from the Royal Museum of Antiquities at Copenhagen," translated by Mr. J. H. Ludwigsen; and an Account of the Primstave and of Remarkable Days, written by Professor A. Munch for the Norwegian Folke Kalendar of 1848, and translated by Mr. J. H. Ludwigsen.

8*th March*, 1855. LITERARY SECTION.

Rev. Dr. Thom, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The Rev. Charles White Underwood, M.A., Vice-Principal of the Collegiate Institution, was duly elected a member of the Society.

The following Donation was laid upon the table :—

From the Cambrian Archæological Association. Archæologia Cambrensis, No. xx. for October, 1854.

Dr. Hume exhibited a folio Concordance of the Authorised Version of the Scriptures, compiled on the basis of Clement Cotton's Concordance, 1631,—by the Rev. Samuel Newman, minister of Rehoboth in New England. It was the first complete and enlarged book of the kind. Its date was London 1650.

Mr. Augustus Harding, manufacturer of the Model of Ancient Liverpool, exhibited two original views of the town, as seen from an elevation, in 1650 and 1855. He intends to publish them, on one large sheet with an explanatory key. An application from Mr. Harding to be permitted to dedicate the Views to the Society, was at once granted.

Mr. Buxton exhibited an ancient printed copy of the Scriptures, slightly imperfect, with the view of ascertaining its date.

In illustration of the paper to be read, Mr. Stonehouse exhibited the following:—Map of Cheshire; Drawing of the tomb of Hugh Starkie, in Over Church; the Church Porch; Water Basin; View of Weaver Hall from the Hunting Bridge; Rubbing of the brass on Hugh Starkie's tomb; Drawing from the Church window, and sketch of carving from a pew.

The following Paper was then read :—

Description of the Parish and Church of Over, in Cheshire. *By James Stonehouse.*

Although the records kept in somewhat out-of-the-way country places do not present to notice any very remarkable circumstances, there is always something to be found in them of interest to those who have a literary or an antiquarian turn of mind.

The town of Over—for town it must be called, since it has a charter of both market and fair, and is presided over by a mayor, although not possessing a body corporate—is situated about a mile from Winsford, one of the Salt-producing towns of Cheshire, four miles west from Middlewich, and four miles from the Hartford station of the Great North-western Railway.

Over is mentioned in Domesday Book, and is there spelt "Ovre." The manor of Over was bestowed by Edward, Earl of Chester (who became Edward the First), in the 54th year of the reign of Henry the Third, to his Abbey of Dernhall.

After the dissolution of monasteries, when Vale Royal Abbey, ceased, amongst other such like things, to be, the manors of Over and Waverham were granted (37 Henry

VIII) to Sir Thomas Holcroft, Knight, in consideration of the sum of £466 10s. 10d., and in exchange for the manor of Cartmell, subject also to a rent of £10 0s. 4d. From the Holcrofts this manor passed to a Mr. Edmund Pearsall or Persell, a London merchant, who, about the time of Charles the Second, sold it to Thomas Cholmondely, Esquire, the fourth son of the Lady Mary Cholmondely, in the hands of whose descendant, the present Lord Delamere, it still remains.

The word "Over" frequently occurs in the names of Cheshire localities, as in "Over Peover," "Overchurch," in Wirral; "Overton," "Over Tabley," "Overpool," "Over Marsh."

The town of Over commences at the west end of Over Lane, which is the high road from Winsford to Delamere Forest. It is in appearance a mere village, having the houses ranged on each side of the road, without any lateral streets. Amongst these houses are some of those oldfashioned dwellings frequently found in Cheshire, of lath and plaster, or brick and timber, which, to the eye of the artist, present so picturesque an appearance. Although Over cannot rank in size beyond the extent of a village, it is, nevertheless, as before stated, a market town. Its charter of fair and market was granted to the abbot and monks of Vale Royal, by Edward I, 1280. The market day is Wednesday. It had been in disuse for many years until 1840, when an attempt was made to revive it, but without success, although a market hall was erected by a proprietary, who made a strong effort to bring it into esteem. The market for the neighbourhood is held at Winsford, on the Saturday, and it would seem that the habit of frequenting it by the country people could not be shaken. After a year or two the market at Over was given up, and the hall was sold to Lord Delamere, who applied it to educational purposes. The fairs, however, are still a favourite resort of the peasantry, farmers, and dealers. They are held on the 15th May and 25th September. Considerable sales of cattle and horses take place, while the usual amusements fill up the afternoons. Near the market hall is a modern cross, which superseded one of great antiquity, supposed to have been erected by the monks of Vale Royal, who erected one also on the high road, near where the branch road turns off to the church. Over Cross surmounts a flight of steps in a pyramidal form, and presents an interesting object to the passer by. Under it is the terror to bucolic evil-doers, the lock-up, and at the back is the pound. The inhabitants of Over are principally employed in the neighbouring salt works at Winsford, and some of them in an extensive silk mill which is in operation in the vicinity of the town. Over is well supplied with excellent water.

Over has a singular custom attached to it, which has existed for centuries. Although not a corporate town, it has a mayor to manage its public affairs. The mayor is thus chosen. At the holding of the manorial court in October, there are two juries empanelled. One of these is called the grand jury, which acts for the town, and the other the county jury, to whom is confided the township affairs.

The grand jury returns to the lord of the manor the names of six of the most respectable inhabitants. The lord of the manor selects one of these gentlemen, who, at an adjourned court, held fourteen days after the first court, is elected to fill the office of chief magistrate. The mayor thus remarkably chosen, does not obtain mere title, for his office is one of some influence. He sits on the bench at quarter sessions, acts as a justice of the peace, and his signature is necessary to be appended to that of a county magistrate in granting licenses to public houses. At the expiration of his term he enjoys the title of alderman. Before the establishment of the county court, the mayor had a sworn bailiff, who executed all processes relating to matters of debt within his jurisdiction.

William Smith, in his "King's Vale Royal," thus speaks of Over—"It standeth at the east end of Delamere Forest, not far from the river Weaver. It is but a small thing, yet I put it in here, because of the great prerogative that it hath. For it hath a mayor, and the church, which is a quarter of a mile from it, south of the town, *is lawless*, which privilege (because it standeth in Eddisbury hundred) I think it hath since the destruction of the city of Eddisbury, which stood some time in the Forest of Delamere, in the same place where the Chamber in the forest is still standing."

Now, Smith, I think, has mixed up in this statement that which is not, with that which is. There were three places of sanctuary, or places of refuge, for malefactors,

runaways, and persecuted persons, in Cheshire, one of which was at Over Marsh, or King's Marsh, between Shochlach and Farndon. I suspect that Smith has confounded Over Church with this place. Over Marsh, as it was anciently called, was a piece of ground set aside for the use of persons who were fugitives. Smith also falls into an error in fixing the locality of Over Church as being a quarter of a mile from the town, as it is at least a mile by the nearest way across the fields, and certainly more than a mile and a quarter by the high road.

At a house called the Bridge End House, the notorious—or, if the term be better approved, the celebrated—Robert, or, as he is sometimes called, William Nixon, the Cheshire prophet, was born. It was only in the early part of the last century that anything was written respecting this person. Oldmixon, in his pamphlet published by Curll, in 1714, collected some particulars relating to him. It is a curious circumstance that neither in the registers of Over Church nor Whitegate is Nixon's name to be found, while several dates are asserted by different authors to have been the times in which he lived. He is said to have died from neglect in Hampton Court, whither he had been taken for James I. to see him. In Lysons's Cheshire there is an interesting account of him.

The progenitors of George Washington resided in Over township, and some of the name are still to be found, I believe, within its limits.

The country in the neighbourhood of Over, especially towards the Weaver, is of a very pleasing character. About a quarter of a mile from Winsford Bridge appear large sheets of water, which are hereabout termed "flashes." These flashes are caused by the subsidence of the rock salt deposit beneath, worn away by the under springs; and it is doubtless from the sudden disappearance of the land, and the speedy presence of water in its stead, that the term for these little lakes has been obtained. The Weaver river runs through the middle of "the flashes." The depth of water varies; in some places it is forty and fifty feet deep, while in others it is so shallow that a boat will not float. Above the flashes the river suddenly narrows, and, after winding about between sedgy banks for a few miles, ceases to be navigable even for small boats. The eastern bank of the river rises in well-wooded land of a most agreeable character. Heavy craft only get up to Winsford Bridge.

The church of Over, which now claims our attention, is dedicated to St. Chad. It is distant from Over town about a mile, as the crow flies. It stands in a hollow, and has a very venerable and picturesque appearance. The style is that of the later period of English architecture. Though not mentioned in Domesday Book, there might have been hereabout at the time of the compilation of that remarkable work some sort of sacred building standing. It is believed that the present church is erected upon a Norman foundation, such foundation having been laid bare or traceable, and it is asserted that a portion of the original building is still extant. The rebuilding took place in the reign of Henry VIII, when doubtless the materials of the former church were used up. The tower is square, of four stories, battlemented, the buttresses ending in finials, which have been much broken. A Gothic frieze is carried under the battlements. About half way up the tower, on the southern side, there is a stone let into the wall, which originally bore a sculptured effigy, probably that of the rebuilder of the church. There are also the remains of an inscription round it, but both figure and inscription are too much defaced to be traceable or legible, at any rate from the churchyard. On the south side is a porch of two stories, embattled. Over the entrance is a window, and above it a shield, bearing the rebuilder's arms, quarterly, with that of Olton. The entrance to the porch is obtained down a step, the churchyard having been gradually raised about it. On the right-hand side of the porch is a water basin, somewhat worn in the front, under a very graceful Saxon crocketted arch. The basin projects from the wall, exhibiting to view three sides of an octagon, ornamented with Gothic niches. The trefoil of this arch has been destroyed, and a representation of it in black paint substituted. This basin has been, and indeed still is, a very graceful piece of sculpture.

The interior of the church has a venerable appearance. On the north side there is private pew room, occupied by the owners of Darnhall Hall; a portion of it is built out into the churchyard. Near the vestry is a remarkably large stone baptismal font, bearing the initials "T. W.," and dated 1662, which some cleanly-minded churchwarden has

loaded with a thick coat of stone-coloured paint. Near the entrance to the private pew, and adjoining the communion rails, is the altar tomb of Hugh Starkey, the rebuilder of the church. The base is of red stone. A singular distribution of the ornamental quatrefoils may be observable. The compartments on the right of the shield are three in number, while those on the left are two. It will be noticed that a portion of the quatrefoil next the shield, on the right hand, only is visible. In the quatrefoils in the wall under the arch, wherein the tomb partly stands, a similar distribution takes place of three and two, only in the latter case the former number is to the left instead of to the right Now, this seems a curious arrangement, but I think the reason for it may be explained. When this altar tomb was first erected, it doubtless stood in an isolated position. In the course of time the tomb becoming decayed, or perhaps desecrated by sacrilegious hands, it was found necessary to repair it. In doing so, the ornamental parts were collected together, and exhibited in the best way they would admit. It seems clear that this was the case, because the wall in the recess at the base of the quatrefoils at the back covers over a strip of the marble top of the tomb, and hides a portion of the shields which are to be seen at the corners. Perhaps the obtuse arch ornamented with crocketts was the original arch under which the tomb stood, while the roods or crosses, or what appear to be such, were a portion of the sides of the arch. It is clear that some alteration has been effected since the time when the tomb was originally erected. The top is of black marble, and bears an effigy of the pious gentleman whose ashes the tomb covers. The inscription, "Et gloria soli Deo honor," is in beautifully formed letters, as are those of "H. S." surmounting the arch. The roods, if such they be, are much broken and defaced, as are the niches in them, in which are some remains of sculptured or carved figures. The effect of the niche and arch is very pleasing—indeed, this tomb is of a highly interesting character. At the foot of the effigy is the following inscription :—

"Of your charitie pray for the soule of Hugh Starky of Oulton Esquier gentelm usher to Henry VIII and son to Hugh Starky of Oulton Esqnier, which Hugh (the son) descessyd the yere of our Lord God MCCCCC——On his Soule Jhu have mcy.

The shields at the corner, which are much defaced, bear the Starkey and Olton arms quarterly. At the steps of the chancel there is another tomb, containing the remains of the father of Hugh Starkey. The inscription is obliterated, but it is known to have been to the following effect :—"Hic jacet copora Hugonis Starkey de Olton armi et Margarœtæ uxoris ejus." The tomb once bore two brass effigies, with armorial bearings. The Starkeys appear to have been persons of great influence and station at one time. They resided at a place called Darley Hall, which stood at the back of the present Oulton Hall, and which was pulled down by Mr. Egerton many years ago. Oulton Park and demesne were their property, and they held the manor of Knights Grange, the manor of Olton, one-third of the manor of Erdswick, and lands in Minshull Vernon, Church Minshull, Worlston, Woodford, Eyton, Rushton, Tarporley, Thingwood, Budworth, and Surlach. One of the Starkeys, Sir Humphrey, was chancellor of the exchequer in Edward the Fifth's reign, and again in the reign of Richard the Third. Another Starkey of note was Ralph, a literary man of some celebrity in the reign of James the First, who industriously collected a great deal of information relative to the arms of the Cheshire gentry. At Hugh Starkey's death, 1555, the estates came into the possession of Oliver Starkey, an illegitimate son. This Oliver Starkey was a knight of Malta, and became grand prior of the order. He dying without issue, the estates descended to his brother James. Either by litigation, or from other causes, the property passed into the hands of the Egertons, with whom it still remains, in the person of Sir Philip de Malpas Grey Egerton, Bart.

In the windows of the church there are remains of stained glass. In the east window there is some tabernacle work. Unfortunately there is but little of it. In the windows of the south aisle are the arms of Starkey and Oulton, quarterly, empaled with the coats of Done and Needham. In the windows of this side also are the figures of John Starkey, of Olton, and his wife Agnes, daughter of Sir John Needham, of Shevington, as we may infer from the blazonry on the shields. Both figures are in kneeling posture, before a desk and book. The figure of the lady is so far mutilated as to leave nothing but the ample skirts of her robe. The male figure is in plate armour, very perfect, and

of beautiful colours and skilful execution. The mullions and tracery of the windows, which must at one time have been very tasteful, have been injudiciously or wantonly removed. In one of the pews there is a carving of a shield, bearing a cross moline, with a griffin's head erased. In the belfry there is a remarkably large chest, elaborately carved, which it is a pity is not placed in some suitable part of the building. There is an organ in the west end, and a gallery fronts it which runs along one side of the church.

The impropriation of the church was given by Randle Gernons, Earl of Chester, to the Benedictine nuns of Chester. When Vale Royal Abbey was founded by Edward, the nuns released a portion of the tithes of a part of the parish, consisting of Little Over, Sutton, and Merton, for which they received 105s. 11d. out of the rents of Middlewich. When the monasteries were dissolved, Bishop Bird obtained a grant of the rectory of Over, with the reversion to his successors. The present incumbent is the Rev. J. Jackson, M.A. The bishops of Chester still possess the right of presentation. In 1755 the vicarage was augmented, and in 1758 lands were purchased to the value of £400 for that purpose. £200 were given by the executors of the late Dr. Stratford, and the remainder by the trustees of Queen Anne's bounty.

The registers commence in 1558. The baptisms are imperfect from 1564 to 1590. The burials are also imperfect from 1567 to 1590.

In Over there is another church, but of modern erection. It is one of the "Weaver Churches," erected by the trustees of the Weaver navigation. The Independents have a chapel, with Sunday schools in connection with it. There is also a burying ground for the members of the congregation. The Wesleyans have a chapel and school. The Primitive Methodists have a chapel. In Over Lane is the Methodist Association Chapel, erected in 1836. The Whitegate School is under the patronage of Lady Delamere. The Whitegate and Over Free School was endowed by Thomas Lee, of Darnhall, in 1699, with the rents of certain lands in Newton by Tattenhall, containing 3163 statute acres. In 1818, a new school was erected, aided by the National Society. The Charity Commissioners discovered several charities bestowed on the poor of Over, which had been misappropriated and irretrievably lost, but at what time or by whom no trace was left.

Respecting the population, it may be briefly noticed, that Over is the designation of a Sub-District of the Registration District of Northwich. In this Sub-District (which is probably co-extensive with the Poor Law Union) there were, at the Census of 1851, 7129 souls, viz., 3608 males, and 3521 females. Of these, there were 11 men and 17 women between the age of 80 and 85 years; there were also 6 women between 85 and 90; 2 between 90 and 95, and 1 who had passed the age of 95 years, and 1 between 95 and 100.

In conclusion I may perhaps be allowed to observe, that in thus stringing together a variety of scattered facts, I think I am carrying out fully the purposes of our society; and to suggest also to any of our members who may accidentally visit some places not familiar to the many, that they cannot render better service than by devoting a little time to gathering together any particulars relating to the history of such place, and putting them down for our instruction. The traveller should come home burdened with information, as the bee wings its way back loaded with honey to the hive. If he think proper to keep the honey to himself, at any rate let us have the wax.

15*th March*, 1855. SCIENTIFIC SECTION.

REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. George Mansfield Browne, of 15, South Hill, was duly elected a member of the Society.

The following Donations were laid upon the table:—

From John Nelson Wood, Esq. A Hand Bill of 1768, announcing the delivery of

Stevens' Lecture on Heads, by Mr. Rogers, at the Bucks' Room in the Golden Lion, Dale Street.

From Thomas Bromfield Ryder, Esq., Secretary. Journal of the Manchester and Liverpool Agricultural Society for 1854.

Mr. M'Quie exhibited an ancient instrument for striking a light; ignition being communicated to a tinder box.

Mr. Rimmer exhibited a copy of Ogilvie's Translation of Virgil, 1684; from which the Rev. Thomas Moore read some MS lines of poetry.

Dr. Hume exhibited a plan and description of the Slave Ship *Brooks*, published in 1789.

In illustration of his paper to be read, Mr. Gregson exhibited fifteen cases of *Lepidoptera*; containing about 1500 specimens.

Mr. Richardson, who had just returned from Constantinople and Egypt, gave an interesting account of his experiences, during his stay at those places.

Dr. Hume announced the discovery of coprolites and large fossil fish between two coal beds, on the eastern shore of New Holland, a few miles south of Sydney.

Dr. Hume also read an extract from a French publication, announcing that the discovery of M. De Perthes,—that human implements were found in connexion with the remains of Antediluvian creatures,—had been confirmed by Dr. Rigollot, in August last, at St. Acheul near Amiens. Numerous scientific gentlemen had examined both the strata and the animal remains and objects found in them; and previous doubts, respecting the correctness of the observations or conclusions, had been completely removed.

The following Paper was then read:—

On the Lepidopterous Insects of the District round Liverpool, with some of the causes of the abundance or scarcity of Insects, by Charles Stewart Gregson.

22nd March, 1855. MISCELLANEOUS MEETING.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations were laid upon the table:—

From the Kilkenny Archæological Society. Proceedings and Transactions for January, 1855.

From Henry A. Bright, Esq. A description of Lupset, the Heath, and Sharlston, near Wakefield; by the Rev. Joseph Hunter, F.S.A. Printed for private distribution, 1848.

The original Protest of Thomas Seddon, Master of the Ship Penelope of Liverpool, 2nd June, 1713.

Two fac-simile letters,—from Miles Coverdale to Thomas Lord Cromwell, 13th December, 1538; and from the Earl of Surrey to the Abbot of Bury, temp. Henry VIII.

Mr. Danson exhibited two "Fast Sermons," or Sermons preached on Fast Days. One was by Gilbert Burnett, 1680, and the other by Mr. Sacheverell 1702. Mr. Danson also exhibited *Mist's Journal*, in one number of which, dated 1723, the policy of Russia was shown to be identical with that of the nation at the present time.

The Rev. J. W. Hill of Waverton near Chester, forwarded for exhibition a book with curious engravings, entitled "Pauli Petavii, in Francorum Curia Consilia, Antiquariae Suppellectilis Portiuncula. Parisius 1614."

Mr. J. G. Stewart exhibited a portrait of the late Duke of Wellington by Clothier, painted from a photograph taken shortly before his death.

Mr. Rees exhibited a rhombus of unpolished glass, about half a square inch in superficies, which had been found with many similar pieces in a cutting in Huntingdonshire.

Mr. Hardman exhibited an ancient coin from Philippi in Macedonia; and Mr. Bright handed round a letter to the editor of the *Champion* in the Strand, with the view of ascertaining its probable date.

The Secretary announced, that by the arrangement of the Council, the letter to the Members, by "one of themselves," on "Science in Lancashire and Cheshire," would be considered at the next meeting.

The following Paper was then read:—
Remarks on the Connexion between Archæology and Natural History, by Joseph Clarke, Esq., F.S.A., Hon.M.H.S.

29th March, 1855. ARCHÆOLOGICAL SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donation was laid on the table:—
From Thomas Inman, M.D. Remarks on Spontaneous Combustion, and the best means of extinguishing fires, pamph. Liverpool, 1855.

Mr. M'Quie exhibited a curious taper-stand, forming also an extinguisher and a box for the taper. He also exhibited two volumes of the sixteenth century,—the "Feotpath to Felicitie" and "Icones Mortis."
Mr. Danson exhibited an old newspaper as a specimen of those in which the letters of Junius appeared. It was the *Gazetteer and New Daily Advertiser* for 13th December, 1769, containing No. 34 of those letters.

The printed letter on the subject of "Science in Lancashire and Cheshire" having been fully considered, a Committee was appointed, consisting of the Council and certain ordinary members then present,—to consider the best mode of carrying out the objects advocated in the letter. They were requested to lay their Report, if possible, before the next meeting of the Society.

The following paper was then read:—
Materials for the History of the two Counties, and the mode of using them, (part ii.) by John Robson, Esq.*

19*th April*, 1855. LITERARY SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. Augustus Harding, of Great Crosby, was duly elected a member of the Society.

The following Donations were laid upon the table:—
From the Society of Antiquaries of Normandy. Memoires de la Societé, vol. x., second series, (xx of the collection) in three parts., 4to. Paris, December 1853, May 1854, and January 1855.
From the Author, M. Charma. Discours D'Ouverture prononcé, par M. A. Charma, President de l' Academie des Sciences Arts et Belles Lettres de Caen, 24th November, 1853, pamph. Paris, January, 1854.
From Henry Johnson, Esq. A bronze celt, found on the opposite side of the rivulet from Kinderton, in Cheshire.

Mr. Boardman exhibited a farthing of 1674, 'Carolus a Carolo,' discovered in sinking the foundations of the Sailors' Home.
Mr. Johnson exhibited an illuminated MS., said to be of the reign of Edward I., containing sixteen documents, including "Magna Carta libertatis Angliae." One of the covers was part of the original oak boards, the other was part of the wood from Prince Rupert's Cottage.

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* For part i, see vol. v. p. 199.

Mr. Johnson also showed to the members two original Acts of Parliament, one of them of the 43rd of Elizabeth.

Mr. Marsh laid on the table for inspection, a volume containing original letters of Dr. Priestley, from which his paper had been compiled; also a portrait of Dr. Priestley.

The Special Committee which had been appointed on the 29th ult., presented their Report, which was read to the meeting.

The Secretary announced that J. T. Danson, Esq., who had acted as Chairman of of the Committee, was the author of the letter alluded to.

It was then moved by Dr. Hume, seconded by the Rev. Thomas Moore, and resolved—

That the Report be adopted, and that the Memorandum and forms of Circulars be referred to the Council.

A communication was read from Mr. James Boardman, intimating that one part of Mr. Harding's Model of Ancient Liverpool was erroneous. A bridge was ordered to be built across the Pool, but that which is represented as a three-arch stone bridge never was erected. His evidence was first negative, no such bridge appearing on any map or being mentioned in any document subsequent to its being ordered; and second positive, as the unvarying tradition of his own ancestors was that the mouth of the Pool was crossed by a ferry boat, and that there was a rude pier at each side.*

The following Papers were then read:—

On some Correspondence of Dr. Priestley, preserved in the Warrington Museum and Library, by J. F. Marsh, Esq., and on Institutions for the Deaf and Dumb,—their objects, difficulties and advantages,—by David Buxton, Esq.

[The following is the form in which the Paper respecting "Science in Lancashire and Cheshire" was afterwards prepared for issue by the Council.]

Introduction.

This Society was founded, on the 20th of June, 1848, at a Public Meeting held in the Collegiate Institution, Liverpool, the Worshipful the Mayor in the chair. Its original Object was,—by collecting, arranging, and publishing,—to illustrate *all those subjects* which are connected with the GENERAL HISTORY of the two counties; and to this the efforts of all the members were exclusively directed for the first six years. During that period, an annual volume of *Proceedings and Papers* was published; and the Society is bound to continue the series,—the size of course depending on the quantity and quality of the matter. An interesting *Library* and *Museum* have also been collected, local in their character and very varied in their contents.

The Council of the Society found, however, that their Laws were too stringent with respect to the local limit; and they were frequently obliged, with reluctance, to decline papers of great value and interest, because they had no direct bearing upon these two counties, or occasionally on any place whatever. They also found that Literature, and especially Archæology, having a much stronger reference to particular places than Science generally, papers on the application of Science were rarely produced, and those on its abstract principles were regarded as inadmissible. For these and other reasons, at a Special General Meeting, held on the 30th of August, 1854, the Members agreed unanimously to extend the objects and operations of the Society, from local and special to general. At the same time, they classified the inquiries under the three general heads of ARCHÆOLOGY, LITERATURE, and SCIENCE; appointing an equal number of Sectional

* In a letter dated 1st June, 1855, Mr. Boardman states that additional evidence has altered his opinion. He is now satisfied that a bridge did exist.

Meetings during each Session, for the discussion of these subjects respectively. They also increased the number of meetings from eight to about twenty; and distinguishing between Resident and Non-resident Members, raised the annual subscription of the former.

A Seventh Session, in these new circumstances, is now nearly completed, and the experience of it is highly gratifying to the Council. The Society has received a large addition of new and valuable members; the meetings, though more frequent, have been much better attended, and have excited a more lively interest; the papers have been numerous, and of a high class; and the promises of intellectual support have been more numerous than on any former occasion.

The Council desire to state distinctly, however, that the Society has merely *extended* its field of inquiry, it has not *abandoned* it; and that a primary, but no longer exclusive, object still is,—the thorough description and illustration of the two counties of LANCASHIRE AND CHESHIRE. Within these limits, most of their members reside; and those who do not, take a special interest in the district. The inquiries of almost all whose contributions give interest to the Society's volumes, are modified by local circumstances, so that it is a matter of convenience as well as of duty to cultivate the field already entered upon. And as the general subjects of inquiry have been separately named, and specific time set apart for their investigation, so it is desirable to systematise the details as much as possible, that every topic of importance may receive due attention.

The Council are fully sensible of the difficulties which they are likely to meet with, in realizing any considerable portion of their wishes. The labourers are all voluntary, for example, and though doubtless both able and willing, and inspired only by the highest motives, they are not yet provided with the requisite facilities for combined and harmonious action. It will be the duty of the Council to consider maturely, how far these facilities can be speedily and efficiently increased.

It has appeared to them, that with such an object in view, they may appeal with perfect propriety, not merely to their own members, but also—and even more pointedly—to others whose labours have thrown light upon any portion of the district. Even apart from any such local reference,—and only bearing in mind the valuable contributions which the Society has already received from without,—they cannot hesitate to address themselves to those who have established an enduring claim on their respect, by individual eminence in any of the branches which they desire to cultivate. It has therefore been thought advisable, to address a personal and respectful communication,* along with this Paper, to a limited number of intellectual men for whom our object may probably have some degree of interest, requesting such counsel or more direct aid, as they may be quite at leisure, and kindly disposed to render.

At the same time, there is addressed to the Members of the Society, a circular letter,* so framed as to afford to each of those who are disposed to take any active part in working out the design, the means of at once selecting and entering upon that department of it, to which previous study or present opportunity may most strongly direct his attention.

* A Form of Letter was adopted for this purpose.

At the third meeting of the first session, a paper was read "ON THE BEST MODE OF CARRYING OUT THE OBJECTS OF THE SOCIETY," by H. C. Pidgeon, Esq., Joint Hon. Secretary. The Council considered it so important, that an edition of it was printed apart from the annual volume, for circulation among those who were not members of the Society; and classified queries were appended to it, showing the subjects most deserving of attention. Nearly fifty topics were enumerated in detail, connected with the subjects of Archæology, Literature, Natural History, and general Science.

During the present session, a similar paper, by John Towne Danson, Esq., F.S.S., one of the Members, was privately printed and issued to all the Members whose names appear in the last printed list. Its title was "SCIENCE IN LANCASHIRE AND CHESHIRE;" and its suggestions referred almost exclusively to Science. The Council regard this as in some degree a fortunate circumstance; because their printed volumes,—to which they can refer with much satisfaction as a specimen of their labours,—contain comparatively few papers on Science, even in the extended sense of the term. They have, therefore, with Mr. Danson's consent, given a portion of his paper a permanent place in their Proceedings, and they gladly avail themselves of that portion, in this document, as expressing generally not only their sentiments, but also those of the Members at large.

They will only add, that in every paper which the Society publishes, the writer alone is responsible for the statement of facts and opinions, and for the omission of those, if any, which require to be stated.

SCIENCE IN LANCASHIRE AND CHESHIRE.

* * * * * *

"Before all else, we have to ascertain the *Physical Geography* of the two counties: and of this, first, the *Geodesy*, or divisions of the surface. These are more numerous, as well as more complicated, and less known, than, on approaching the subject for the first time, one is apt to suppose. They are, in character, civil, ecclesiastical and military, as well as natural. The civil divisions, which are of the greatest practical importance, are often hard to learn with precision, when such knowledge of them is needed. The divided areas of local taxation, and of local government: as townships, parishes, hundreds and counties, the boundaries conferring electoral rights, the limits of the jurisdiction of local courts, and the districts formed for the registration of births, marriages and deaths, afford instances of lines each of which is in constant use, and few of which coincide with any of the rest. All, so far as they are of use, should be known. But, apart from their immediate use, all are worthy of precise definition, as well for their historical value, as for the basis such information must afford to legislation for their improvement.

"The lines of division being laid down, we might next ascertain and record the precise latitude and longitude of remarkable fixed points—especially of our observatories.

"The *Orography* of the district is not only especially interesting, but also, I believe, admits of being presented, from existing materials, in a tolerably complete form. Few parts of the island exhibit a greater variety of surface with regard to altitude, or exhibit it under circumstances more interesting. The level country in the south and south-western part of Lancashire, and the great plain of Cheshire, backed along the whole eastern border of the two counties by the central hills of England, and pierced by the valleys of the Lune, the Ribble, the Wyre, the Mersey and the Dee, afford almost every variety of altitude habitable in England. And further north we have, in the southern extremity of the Cumbrian range, and in the basins of Windermere and Coniston

Water, orographic features still more remarkable. And here, be it observed, a thorough execution of our work will require us to ascertain not only the elevation of principal points above a common level, but also every considerable modification of the surface in relation to height. Much of this is already done; leaving to us only the labour of judicious selection and compilation. The surveys for canals, and for railways, have called into existence well verified sections through the more densely peopled localities; and for the more elevated and the thinly peopled districts, we have the results of the levelling operations performed in connection with the ordnance survey. Nor is it probable that, if sought for such a purpose, access to any existing materials whatever, on this or any kindred topic, would be denied to the scientific enquirer.

"The *Hydrography* of the two counties—considered as another branch of their physical geography—presents itself in the double aspect of *exterior* and *interior*. We have a clear seabord westward of more than one hundred miles in length; and to this we may add a line of salt-water shores, within the shallow estuaries so remarkably characteristic of our coast, of some hundred and thirty miles more. The depth of the water along these lines, at ebb and flood tide—the action of the sea on the coasts—the extent and character of the sand-hills, and the river-bars—the encroachments, recorded or threatened, and the sea-walls raised to prevent them—the tides, their mean rise, neap and spring, and any observed local variations—the direction, volume, rapidity, and observed effects, of currents along the coasts, are all points of more or less interest, the determination of which must precede a scientific knowledge of the very land we occupy.

"Of no less moment, and more within our reach, is the *interior* hydrography of the country. Our rivers are small, and not generally picturesque; but among them are the most useful streams in the world. And about them we have yet much to learn, and still more to collect and put upon record in a precise and reliable shape, fit for general use. For instance, we should know, as exactly as might be, their sources (constant and intermittent), their length, course, depth of fall—taken upwards from a fixed tidal level, and carried successively to every point of utility, and thence up to the principal sources—the volume of water and the rapidity of flow at important points, and at different seasons, throughout a series of years—the existing shoals, their position, form, extent, and tendency to shift, with any observed relation of such tendency to known tidal or other currents.

"Of the lakes, we ought to know the level of their waters, with reference to a fixed sea level, and its variations (if any), their extent, form, depth, and the connected streams, affluent and effluent. And similar data are required as to our marshes and bogs—in particular of the extensive peat mosses so numerous in Lancashire, alike in the high and in the low districts.

"Finally, the entire water shed of the two counties, which is known to differ remarkably, in some of its incidents, from that of any other district of like extent in the kingdom, should be minutely and carefully delineated.

"We come next to what may be termed the *Terrestrial Physics*, as distinguished from the physical geography of the district. With a surface of tolerably regular slope from a considerable elevation, nearly due westward to the sea-level, and a wide expanse of open and deeply indented coast facing the prevailing winds from the Channel, and more remotely from the Atlantic, we have reason to expect from observations in this department, easily made and of a very simple character, results, not only interesting in a scientific point of view, but suggestive of many useful applications. The surest test of the progress of material civilization is found in the gradual discovery of the powers of nature, and their application to the purposes of man; and no means to this end more effectual have yet been suggested than a patient and systematic observation of such natural phenomena as we have here to deal with—familiar, more or less, to all—calculated to be useful to all—but little noted, because familiar, and hence little known in a practical sense.

"We should know the temperature of the soil, as well at various depths as at the

surface, with the diurnal, monthly, and annual oscillations of the thermometer; and this at spots selected for their difference of elevation, soil, and aspect. A like series of observations upon the waters of springs, rivers and brooks, lakes, and the sea along the coast, could not fail to throw additional light upon the same subject. We have even some rare opportunities of examining the oscillations of temperature occurring simultaneously in large masses of water in the same locality, and at different elevations. I may instance Easthwaite and Coniston lakes, in the district of Furness, near to each other, and with a (reported) difference of elevation amounting to upwards of one hundred feet.

"Scarcely less easy of observation, though less obvious till observed with care, are the phenomena of *Terrestrial Magnetism*. We require an accurate notation—diurnal, monthly, and annual—of the declination; the actual value of the inclination and its annual diminution; and the observed intensity of the magnetic force, with its variations. It would also be useful to register, with as much precision as possible, the length of the pendulum beating seconds at each of our observatories, the exact latitude and longitude of which should be ascertained.

"*Meteorology*—a science which is but just taking rank as one of logical deduction from observed facts, we can do as much to aid the practical advancement of as any body of men in the empire. Nowhere in the world would a sound exposition of the laws governing the weather be more valuable than in Lancashire and Cheshire; and in no district of similar extent are there a greater number of persons who know this, and who have all the requisites of good observers of the phenomena from due registration and examination of which we can alone hope to learn these laws. The barometer, thermometer, rain-gauge, and anemometer, are now all well-known instruments. Little costly now, they would be less so if more generally used. And it would not be difficult for a society like ours to arrange for a daily and simultaneous registration of the weight, heat, and moisture of the atmosphere, the direction and force of the wind, and the fall of rain, in some hundreds of selected localities within the two counties. Concert with the managers of the existing observatories would secure the necessary correspondence in time and in method; and neither the time nor the money required would be felt as an obstacle by any one of many hundreds of active men, who, in this part of the country, apart from any care for the science in the abstract, would willingly know better when to look for fair and foul weather. The amount and variations of the electricity of the atmosphere do not, at present, admit of being so generally observed; but even here much more might be done with ease than is at present attempted.

To say that the *Geology* and *Mineralogy* of Lancashire and Cheshire are worthy of all the attention we can give them, is but to paraphrase what all the world has been saying of us for the last fifty years—that the main springs of our commercial greatness lie under our feet. The distribution of the coal-measures of England, westward of a line from Newcastle to Nottingham, and thence to Plymouth, has, for the last half century, determined the distribution of the population, the productive power, and the political influence of the country. Yet the situation and extent of our coal fields remains to be ascertained with the fulness and precision the importance of the subject demands. Some of them, especially such as are detached from the larger beds, are but partially explored; and others, probably, are quite unknown. The more systematic working of the mines, during the last twenty years, has brought into existence, in private hands, a large quantity of valuable materials, in the shape of underground maps and measurements, and reports upon the state and tendency of the more extensive workings, the greater part of which, so far as they would be required for a purely scientific purpose, would doubtless be laid open to competent and trustworthy enquirers acting under the auspices of our Society.

"Nearly the same remarks, as to the paucity of recent and reliable information on a most important topic might be made as to the saline deposits of the valley of the Weaver and its affluents. These form one of the most remarkable mineralogical features of the island; and, properly regarded, afford an opening for local research, than which there are few more tempting, or more sure to reward whatever exertion

may be honestly and intelligently bestowed upon them. It is certain that the means do not, at present, exist for delineating, with even tolerable completeness and accuracy, the locality and extent of the beds of fossil salt now existing in Cheshire. And much, even of what is locally known, remains unrecorded, and to science useless. We ought also to be better informed than we are as to the limestone rocks on the eastern borders of our district, and the workable slate deposits in the neighbourhood of Ulverston.

"If we aimed at the formation of a good geological map of the two counties, to be formed by imposing, from time to time, upon the best general surveys extant, the corrections suggested by local enquiry, we should perhaps take the course most likely to yield early and satisfactory results in this department.

"Ascending in the scale of observation, we encounter the *Botanical Geography* of the two counties—and with it may take the distinct but allied departments of *Descriptive and Applied Botany*. Here we shall begin to feel the need of a judicious but somewhat rigid limitation of the range of our enquiries. It is not with the delightful science of botany, even within our own district that we have to deal; but with its broadest and best recognised results. We have, in Lancashire and Cheshire, many able botanists; and some of them in the Society. All would, no doubt, be ready to put upon record local observations of value, otherwise likely to be lost; nor need we apprehend that they, or any others devoted to a special science, would fail to recognise the over-ruling duty of the Society to give to each department the place and scope dictated by its manifest relation to the general design.

"The influence of altitude, as marked in the orography, and of soil, as evinced in the geology of the country, is first found strikingly developed in the geographical distribution of our indigenous plants; but even here we are compelled to go many steps forward, and refer to the growth of the human population. The land, in being denuded of its ancient woods, drained and cultivated, has, undoubtedly, acquired another soil, and a new climate; and has altogether ceased to afford a fixed habitat for many plants that flourished here in the days of the Saxons. Pending which changes, however, many other plants as well as many foreign animals, have been introduced. Whence the somewhat compound aspect alike of our botany and our zoology. In both we observe that the exotic specimens, if less numerous, are far more important than the indigenous: nay, even that the former have become, on the whole, the more familiar, and the latter the more curious objects of research. To mark, where we can, the steps by which the change has been effected, and then to describe what exists around us, seems to be the only feasible plan. Neither the zoology nor the botany our Teutonic ancestors knew would now be easy to learn, or of much practical value if learnt; and if any of us be disposed to dwell with regret on the chaotic aspect of the past, and the painful impossibility of re-animating extinct genera, we may perhaps find profitable diversion in turning to the future, and considering what further novelties, animal and vegetable, might still be introduced, under the vulgar but powerful plea of utility.

"Of our *Agriculture* it is commonly believed that the better we know the less we shall be satisfied with it. The existing records are vague and incomplete. But of the methods now in use much might, undoubtedly, be learnt by opening communications with the local agricultural societies and clubs. We have, I believe, amongst us some able men engaged in agricultural pursuits, who could afford material aid in procuring and elaborating such information. And for the extent of land under different crops, from year to year, we have an immediate opportunity of assisting, with such influence as we may possess, the projected collection of the statistics of agriculture by the government. An opportunity it behoves us to seize: for, as we may reasonably hope to be among the first to interpret and to use these returns within our own limits, we should not neglect to take what part we properly may in the preparatory process.

"Our situation in the north-western section of the island makes our *Mineral Industry* also a most important topic. And first of our *Coal*. The quantity raised and consumed in various ways within, and exported from, the two counties, has hitherto been known only through the vaguest conjecture. To some extent it must still be so.

But we might do much by the energy and intelligence of those living on the spot to render the conjecture more complete in its basis; and hence, more trustworthy. Again, it is known that the prevailing modes of working are extremely wasteful. And by learning and making generally known the best modes of combining economy with profit, in this respect, we should adopt the most direct means of conferring upon the community an advantage equivalent to placing an additional supply within its reach. There is also a serious waste of human life currently incident to the present mode of raising this mineral. Humanity apart, there is a great lack of economy in this. It has been shown that defective ventilation is the chief cause of the mischief; and though the government has, for some years, had an inspector at work, who annually contributes to the literature of parliament one of the most sensible of its periodical blue folios, we know that the mischief continues. We know, too, that improvement of the kind here required is to be expected rather from the collection and diffusion of sound knowledge of what the most prosperous and intelligent of the coal owners are doing, than from legislative interference, or the perusal of blue books.

"The value of the *Salt* annually supplied to foreign countries, from the mines of Cheshire, now exceeds two hundred and fifty thousand pounds. The total quantity raised is greater than that raised in any other locality in the world. The consumption in this country is enormous; and can only be roughly conjectured. There are very few more useful substances raised from the earth. Apart from its extensive culinary uses, it subserves an immense variety of manufacturing processes—the glazing of coarse pottery, the making of transparent glass—the hardening of soap—the melting and assaying of metals—and the dying of woven fabrics, being prominent instances. Were it rarer, it would be more closely studied, better known, and more useful still. Its abundance and its cheapness—one of the great unnoticed physical blessings of our land—has been suffered to depress it, its incidents and its methods somewhat beneath the notice of scientific men. To whose discredit I need not say.

"Rather historical than scientific, but not the less appropriately introduced here, is the subject of our *Public Works:* as the principal edifices, roads, bridges, viaducts, aqueducts, canals, docks, waterworks, gasworks, &c. Few historical changes are fraught with considerations more interesting than that wrought in our own day, in the economy of our highways by the introduction and gradual extension of the railway system. Fortunately we are enabled to trace this change with some approximation to accuracy, by means of official returns. Annual accounts, uniform, and duly verified, for a long series of years, and extending over the whole kingdom, enable all who may take the requisite trouble to follow and mark every step in the financial progress of our turnpike trusts, down to the present time. And as the results of the change are likely, at no distant day, to necessitate a re-organization of the system under which our turnpike roads have hitherto been constructed and maintained, we have here a double inducement to enquiry: the propriety of recording what has been, and is about to pass away, and the probability that our timely attention to the facts may the better enable Lancashire and Cheshire to take an intelligent part in the coming discussion.

"In the maintenance of our township roads we find one of the few subordinate departments of the government of the country which are still left almost exclusively to the narrowest local influences; and so left, as those who are personally affected well know, with but doubtful wisdom. If a short statement were drawn up of the length of these roads now in use in the two counties, the number of officers annually elected to levy and collect rates and keep them in repair—of the length of such roads *not* reduced to much less than the statutory width, wherever the value of the land has tempted to encroachment, and the length of those fit for the passage of any but the rudest vehicle—its exhibition would probably astonish some of the best informed persons in our larger towns.

"The railways of the two counties have never yet received the distinctive treatment they so well deserve. Apart from the fact that the uses of the railway were first developed, and those of the locomotive originated, within our own district, both have been used so long, to such an extent, and under circumstances so various, as to afford

what is perhaps the best available basis to be found in any one locality for estimating with precision their bearing on the social characteristics of the age.

"Our bridges, viaducts, and aqueducts may claim attention rather by their ingenuity than their grandeur—by their ready and effectual adaptation of ordinary materials to the demands of various exigences; and our modern methods of construction may give most of them but slender chances of antiquity. Yet are they worthy of attentive observation; if only as illustrating the modes of life and action of a population more numerous and more active than the two counties ever before contained. Rivers and valleys have quite ceased to obstruct, or turn aside, our new roads; and the concentration of dense masses of people has repeatedly renewed before us, with various results, the water problem so magnificently solved two thousand years ago by Imperial Rome.

"With canals, as with railways, we were the first to use, and, in England, have hitherto been the largest users. It is now (1855) exactly a century since an Act of Parliament was obtained sanctioning the short canal from the mouth of Sankey Brook up to Gerrard's Bridge and St. Helens—the first made in this country. And where can we now look for a complete and intelligible description of our internal navigation—of the existing lines of canal, their course, dimensions, variations of level, means of water supply, cost of construction and maintenance, number and tonnage of vessels afloat, and men employed, general character of traffic, rapidity of transit, cost of conveyance, &c.?

"A view of our *External Navigation*, though a very imperfect one, might be obtained from the published accounts of the Board of Trade. But how much more circumstantial and perfect are the records existing, unused, and, except as to current transactions, perfectly useless, in the hands of the officers of each of our outports? Holding our meetings in the first port in the world, we have but one excuse for blindness to the value of scientific knowledge on this topic—the poor one that familiarity has dulled the edge of observation—making of the very fitness of the task a reason for not doing it.

"Another record of our progress will be found in the alterations it has gradually effected in the value and the uses of *Landed Property*. The amount of the *tithes* and the *land tax* in different districts, and the proportion of the former commuted, and of the latter redeemed, are also quite worthy of notice, and might be readily learned from existing documents. And the extent to which our common and *waste lands* have been enclosed, and *copyholds* enfranchised, might claim attention under the same head.

"On the subject of *Local Taxation*, including the poor, the county, and all the connected rates, a reference to the Report of the Poor Law Commissioners, published in 1844, where it will be found treated with admirable lucidity, and by a method perfectly exhaustive, seems more appropriate than any remarks I could offer of my own.

"The *Pauperism* of the two counties, during the last twenty years, is also well mirrored in the publications of the same department of the government, and needs, to fit the material for our purpose, little more than the labour of selection, with such a view of the contemporary condition of other districts as might fairly exhibit the comparative condition of our own. If we were informed only of the number, locality, and extent of the existing unions, how far they are conterminous with the county boundaries, the annual amount of the poor-rate (properly so called) in each, stated for a consecutive series of years, with any illustrations, afforded by local knowledge, of the variations observed, we should have taken at least one step towards the elucidation, within our own borders, of one of the saddest social problems of our time. What we still want for the entire kingdom—a special pauper census, taken annually, and bringing to light, as indices to the origin of pauperism, every ascertainable particular of the past character, condition, and conduct of each of the sufferers—might easily be tried, under the influence of a Scientific Society, in some single union.

"All we know of the twin social perplexity—*Crime*—has long dumbly pointed to the same mode of treatment, as the only one likely to yield the fruit we seek. The number,

ages, and degree of instruction of persons committed for each class of offence, the event of trial, and the sentences pronounced, have for some years been regularly made known; and from these data have been deduced some valuable inferences respecting the sources of crime in its various forms. Thus have we, certainly, approached these sources more nearly than was deemed feasible thirty years ago. But there is much yet to be done; and no locality in the kingdom in which it could more fitly be attempted than our own; nor any body of men more likely to continue the work in the right spirit: a condition obviously essential.

"The organisation of our police—urban and rural—has a kindred interest; and its improvement of late years makes it a hopeful, though, in some respects, hardly an agreeable subject of observation. An account of the extent and cost of the preventive and detective police, correlatively to the growth or diminution of crime, in different districts, has already been attempted for the entire kingdom; but we still want such a comparison for the two counties.

"Avowedly successful as an experiment, our county courts every year increase in value, and have already effected a remarkable change in *the administration of justice* in Lancashire and Cheshire. But they are not our only local courts. And we still need a proper account of all these courts, the nature and limits of their jurisdiction, the number and powers of their officers, by whom appointed, and how paid, the expense of proceedings, the number of suits annually instituted, and such other particulars as might show the actual working of each of these tribunals, and hence, in some degree, their practical fitness to discharge the duties imposed upon them.

"To describe the *Commerce*, exterior and interior, of our district, in any other than a somewhat narrow and technical sense, would be to exhibit almost the entire active life of our population. Without this commerce, not one-tenth of our number would find subsistence upon the two thousand eight hundred square miles of land we occupy. But, even regarded from the most technical point of view, there is not yet extant any distinct description of our commerce—its basis, its methods, its growth, its character, its extent, its tendencies, and the apparent indications of its probable future. One topic under this head has a special claim upon our attention. I allude to the recent introduction into this country of Chambers of Commerce—institutions already assuming an office and a power hitherto unknown amongst us; and whence, glancing at their foreign origin, we may yet look for means of further usefulness. The establishment of special tribunals, presided over by eminent commercial men, for the adjudication of commercial disputes, might be deemed too serious an invasion of "the constitution;" but a British version of the French "conseil de prud'hommes"—a body practically adapted to play the part of arbitrators and conciliators between masters and workmen—seems to meet too precisely a well-known and very urgent want of these times not to merit a fair trial.

"Our institutions of a *Providential* or *Charitable* nature: as savings' banks, friendly and benefit societies, and burial clubs—with almshouses, hospitals, dispensaries, and others of a more public character, though usually regarded apart, would perhaps be most fitly treated in connection with our workhouses and gaols. The sufferings of humanity, throughout their entire circle, are intimately allied with the interests of social order; and the self-help of the provident, no less than the social help of the charitable, have, when worthily directed, a common purpose with the suppression of crime and pauperism. Our savings' banks have now been fairly in use for nearly forty years; and the time seems to have come when their social tendency might be examined and estimated with safety, especially in a district offering to view a great variety of the classes for whose benefit these banks were founded. The more generally valuable friendly and benefit societies, applying as they now do, or should, some of the most recent and important observations on the sickness and mortality of the town and country populations at different periods of life, and in different occupations, afford a subject of observation interesting alike for its bearing on the material welfare of those most nearly concerned, and for the light it will be found to throw upon the condition and prosperity of what, after all, must be deemed the most important section of society.

"Passing from the institutions intended by society to exert a reformatory or preservative influence upon the adult population, we come to those more hopefully directed to the training of the yet unformed character. Our colleges, schools, libraries, lecture rooms, and museums are not what they were for the last generation. The nature of the change, and its observed effects, do already engross much attention; and it were well if both were more attentively considered, and better known.

"Our institutions of a *Sanitary* character—as baths and wash-houses, gymnasiums and parks; and our places of *Amusement*—as theatres, exhibitions, concerts, race-meetings, &c., are all worthy of observation; and will be found, in particular, remarkably illustrative of the peculiar influences for the time being in operation among the more educated classes to modify the civilization of the lower.

"Of the public appliances of *Religion*, perhaps little more can be profitably enquired about, or discussed, in our day, than such details as have already been made known through the last national census.

"But the same census, and those which have preceded it, have placed at our command, a mass of materials, touching the number, ages, and civil condition of the people, our own share of which we have not yet made much use of. We want, in the first place, any local records worthy of trust, even as to small districts, showing the population at periods anterior to 1801. We also want, and might, with no great labour, have, a separate analysis of the materials touching the two counties furnished by the general census, comparatively to the rest of the country, and in relation to all the more prominent and observable elements of our social condition. A work of this description would be scarcely less interesting to the world than to ourselves. Excepting only the metropolis, the Liverpool district is now the one most densely peopled in the whole kingdom. While the population of England and Wales was little more than doubled between 1801 and 1851, that of "the north-western division," formed by Lancashire and Cheshire," was very nearly trebled. At the beginning of the century, our share of the inhabitants of England and Wales was less than ten per cent. of the whole; and in 1851, it was nearly fourteen per cent. In fine, we have, inland, the most important manufacture, and on the coast the largest commercial port in the world.

"Perhaps this part of our subject would hardly be complete, scientifically, without some reference to the *Ethnology* of the district. This, in its earlier stages, seems to be permanently obscured, to an extent forbidding the hope of any very satisfactory results from its exploration. But the ethnology of our own day offers a fair field for, and a strong inducement to, close investigation. The gradual influx of labour from every part of the kingdom to the seat of the cotton manufacture, and especially from Ireland, during the last fifty years, has, no doubt, materially modified the previous characteristics of the population. And most of the facts required are now on record in the decennial censuses.

"So much for what is to be done. Now for the manner of doing it.

"It is obvious that the data required to be brought together, will, in every instance, be found in one of four different states. That is to say, they will be—

"A. Known, recorded, and published—
"B. Known, and recorded, but not published—
"C. Known, but not recorded—or
"D. Unknown.

"Scarcely less obvious is the inference that to make them available, will require, as to each state, its own kind of ability and exertion. A large proportion of what we have to look for will be found in the state A. This will need, at most, to be selected, verified, and arranged. Much of what has been published on the topics most interesting to us, has emanated from residents in our own district, or members of our own body. The data found in class B would require also the preliminary process of being made accessible, having, in most cases, been called into existence only for more limited purposes. In the class C, may be placed all information—sufficiently accurate for our

purpose, already possessed by individuals, but not yet recorded in any regular form. Class D would, of course, include all that should not fall within any of the rest. And it is conceived that, by the voluntary agency of the members of the Society, elicited by due instruction and encouragement from our leaders, the whole might, within a few years, be so completed as to form one of the noblest monuments of local learning the world has yet seen.

"The scheme thus imperfectly laid before you, taken in its widest amplitude, would, it is conceived, be in no degree beyond the scope of the assumed duties of the Society. It would not in any manner invade or supersede the functions of any other body, or the proper occupation of any individual whatever. It would impart to our scientific efforts the stimulus of a definite and lofty purpose, and would tend to substitute, among our members, the united strength of co-operation for the divergent weakness of isolated labour.

"Every step taken towards the attainment of the magnificent object in view would be a step gained for ever for all who might thereafter seek knowledge in the same direction. Should we even abandon the work when half done, no part of our labour would be lost. Embued with the theoretic value of a well constructed plan, it would also, so far as it might be carried, form the latest and most perfect record of the science of Lancashire and Cheshire; and by clearly foreshadowing what ought to be done, would at least make more facile its final accomplishment. Adequate elaboration of a single section of the wide field of local science we have so boldly entered—and entered, let me remind you, in days when words of promise are well weighed, and their corresponding deeds closely scanned, and when no mere array of names may win the dues of scientific merit—would at once place us upon an honourable footing with our best compeers. To make the field thoroughly our own by labour, as it is already ours by prior occupation, would earn for the Society a character not unfitted for comparison with that of any scientific body in Europe."

26th April, 1855. SCIENTIFIC SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The Rev. Edmund Hinde, B.A., of Hale, was duly elected a Member of the Society.

The following Donations were laid upon the table:—

From Alfred John Dunkin, Esq. The Archæological Mine, including a History of Kent; parts i. to xxi. inclusive, (except some sheets which are deficient.)

From H. J. Cauty, Esq. A Photograph of St. George's Hall, and another of the Liverpool Observatory.

Mr. Cauty sent for exhibition, a series of eleven micro-photographs, taken by Mr. Wenham, Scale of the *Podusa plombea; Navicula angulata*, Section of the spine of a Hedgehog; Lobster insect; Antenna of a moth; Tooth of a rat; Tongue of a spider, *Ipera diadema: Volvox globata;* Proboscis of the Scorpion fly; Tongue of the Saw fly; Teeth of the Tadpole.

Mr. Poole exhibited seven numbers of the newspaper printed on board the Marco Polo, and entitled the *Marco Polo Chronicle*. There were ten numbers issued in all.

Mr. Lidderdale exhibited an ancient engraving, of the date 1670. It was connected with the event historically known as Stockholm's blood-bath; when in 1520, Christian II. of Denmark, "the Nero of the North," caused the Swedish nobility to be massacred.

Mr. Rimmer exhibited a copy of the Statuta Concilii Florentini, 1518.

Mr. Fisher exhibited a volume of tracts on Gardening and Husbandry, of the dates of 1636, 1637, and 1638 respectively.

In illustration of his own paper to be read, Mr. Rylands exhibited upwards of forty

original drawings of snow-crystals; also a design for room-paper, prepared for the Paris exhibition from a combination of two of the forms.

In illustration of his paper to be read, Lieut. W. Lord, R.N., exhibited four charts, showing the results of the self-registering tide-gauge, at St. George's Dock and Hilbre Island. Those from the town tide-gauge were accompanied by daily registers of the state of the Barometer, and also of the force and direction of the wind,—furnished by Mr. Hartnup of the Liverpool Observatory.

The following Papers were then read:—

On Snow Crystals, by T. Glazebrook Rylands, Esq.; and on the Results of the Self Registering Tide Gauge, by Lieut. W. Lord, R.N.

3*rd May*, 1855. ARCHÆOLOGICAL SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations were laid upon the table:—

From the Right Hon. Lord Londesborough. Miscellanea Graphica, a collection of ancient, mediæval, and rennaissance Remains, in the possession of Lord Londesborough. Illustrated by F. W. Fairholt, F.S.A., 4to. Parts i. ii. iii. and iv.

From the Author, the Rev. Henry Christmas, M.A., F.R.S., Professor of British History and Archæology, in the Royal Society of Literature. A Letter on the Present Condition and Future Prospects of the Society of Antiquaries, of London, addressed to the Earl Stanhope, President, pamph. 8vo. 1855.

From the Author, Charles Roach Smith, F.S.A. Collectanea Antiqua, Vol. IV. pt. 1.

From the Editor, Joseph B. Yates, Esq., F.S.A., F.R.G.S. The Right and Jurisdiction of the County Palatine of Chester, the Earls Palatine, the Chamberlain, and other officers; with Introductory Notes by the Editor. Printed by the Chetham Society, 1855.

Mr. M'Quie exhibited three ancient Guide-books, viz., the Liverpool Guide by Moss, 1799; the Picture of Liverpool by W. Jones, 1805; and the Stranger in Liverpool, by Kaye, 1807.

Mr. Comber exhibited two documents, said to have been found in the strong box and closet of Charles II. by his brother James II., showing the leaning of the former to the Church of Rome. This copy had belonged to J. C. Brooke, Esq., Somerset Herald, and was in the handwriting of the close of the 17th century.

In illustration of his paper to be read, Mr. Mayer exhibited several hundred specimens of pottery, chiefly of local manufacture, also a large number of drawings and prints on the same subject.

Mr. Sansom mentioned that the MS belonging to Speed, to which a communication of his brother's, which had been read on the 8th of February referred, was about to be printed as one of the volumes in the Camden Society's series.

Dr. Hume read two quotations, one from the Transactions of the Society of Antiquaries of Normandy, and the other from the papers of the Architectural Society of Worcester,—in which some of the Honorary and Ordinary Members of the Historic Society were spoken of in high terms,—particularly Mr. Roach Smith and Mr. Mayer.

The following Paper was then read:—

History of the Pottery Manufacture in Liverpool, by Joseph Mayer, F.S.A., F.R.A.S.

10*th May*, 1855. LITERARY SECTION.

J. TOWNE DANSON, ESQ., F.S.S., in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following Donations were laid upon the table:—

From the United Societies. Reports and Papers of the Architectural Societies of the Archdeaconry of Northampton, the County of York, the Dioceses of Lincoln and Worcester, and the County of Bedford, 1854, Vol. III. Part 1.

From the Rev. J. W. Hill, M.A. Pauli Petavi in Francorum Consilia Antiquariae Suppellectilis, Portiuncula, Paris 1614.

From Alfred John Dunkin, Esq. The Archæological Mine and History of Kent, Part xxiii., May.

From J. Towne Danson, F.S.S. A Statistical Abstract for the United Kingdom,—from the returns of the Board of Trade; for fifteen years 1840-54.

Mr. E. J. Rogers exhibited eight etchings by De la Bella, 1661, principally views from the gardens of Versailles. Also, ten portraits of the Dukes and Electors of Saxony; a Portrait of Elizabeth Christina, Queen of Prussia; and an engraving after Vincent Gotta,—subject St. John the Baptist.

Mr. Stonehouse exhibited an Italian book,* supposed to have belonged to Shakspeare, and which exhibited his autograph on the parchment inside the cover. On the subject of the genuineness of the autograph, the opinions of the members were divided.

Mr. Browne exhibited a book entitled "The Sermon which Jesus made on the way to Emmaus, &c.," London, bl. let., 1578.

Mr. Buxton exhibited a copy of Hudibras, with illustrations by Hogarth, 1739.

Mr. Danson laid on the table Lieutenant Maury's Physical Geography of the Sea, and made some remarks on the importance of the subject, 1855.

The Rev. J. W. Hill, M.A., exhibited the following in illustration of his own paper to be read. The Rectory House, Waverton; Drawing of Waverton Church; Photograph of Do.; West Door and Window of Do.; Map of the Parish; Lower Huxley Hall, Waverton; Sketches of the ancient oak trees, Hatton Hall; Fragment of bark of one of the trees; Gateway, Lower Huxley Hall; Bridge over the moat, Do.

A communication was read from T. T. Wilkinson, F.R.A.S., Burnley, entitled "the Burnley Haymakers;" consisting of a local broadside ballad with explanations of the circumstances in which it originated.

The following Paper was then read:—

PAROCHIAL NOTES RESPECTING WAVERTON, NEAR CHESTER. *By the Rev. J. Wilbraham, Hill, M.A.*

[The following is an abstract of this very interesting paper.]

The most ancient name of this parish is Wavretone, as it is thus written in Domesday Book. In Lysons's Mag. Brit. it is written variously, "Warretone, Waverton, or Warton," which is the present vulgar pronunciation.

The parish consists of three townships, viz., Waverton, Hatton, and Huxley. It is agricultural, and contains 4041a. 2r. 37p, statute measure. It is celebrated for its cheese, which is made largely, and sent by railway to London. Of the parish, nearly three-fourths is pasture land. There is a "Fox Covert" of 9a. 0r. 2p., called "Warton Gorse," in the township of Waverton, and another in Huxley township, of 7a. 1r. 12p., both held by the Tarporley Hunt.

Waverton township is four miles S.E. by E. from Chester, and is intersected by the Chester and Ellesmere Canal. The L. and N.W. Railway runs through two townships, viz., Waverton and Hatton, and the first station from Chester is at Waverton. Two coal wharves have recently been established at Waverton, one supplied by the L. and N.W. Railway, and the other by the Canal. Some Roman Cement Works have recently been erected at Egg Bridge, in this township, on land belonging to the freeholders of Waverton.

At each end of the parish, viz., at Waverton and Huxley, there is a post office.

Though Ormerod speaks of this parish as "flat and uninteresting," yet this is relieved by the fine views of the Welsh Hills, in the west, of Beeston and Peckforton

*Commento di Sr Agresto da Ficarvolo, sopra la Prima Ficata del Padre Siceo, 1538.

Castles on the south and east, and of Helsby Tor Hill and Delamere to the north. Waverton is very healthy, having a substratum of sandstone. Close to the railway station is a quarry, (the property of the Marquis of Westminster, who is principal landlord of the township,) from which Chester Cathedral was extensively repaired in 1819. The Chapel of the Chester Training College, and perhaps the fine tower of the Parish Church, were also built of the same material.

Health of the Parish. The Registers for the last 40 years have 550 deaths, or less than a yearly average of 14. Of these, 153 were above 70, 64 above 80, and 14 above 90 years of age. A head stone records John Williams as 105, and his wife Esther as 95, at the time of their death.

Population. On the fly-leaf of the Registers, commencing 1755, is inserted—"On August 22, 1774, there were in the township of

	Families.	Inhabitants.		Males.	Females.	Above 14 years.
Waverton..	51	263	viz.,	131	132	160
Hatton ..	29	174	„	80	94	115
Huxley ..	36	205	„	99	106	131
In this Parish	116	642		310	332	406

In 1851, the Census was				Inhabited Houses.
Waverton	357	170	187	62
Hatton	164	85	79	25
Huxley	267	135	132	47
	788	390	398	134

The Manors. The Marquis of Westminster is the present Lord of Waverton, having purchased it from the Massies, to whom it had come from the Duttons. Of Hatton Manor the Marquis of Cholmondely is the Lord, one of whose ancestors purchased it from Mr. Massie, to whom it also had come through the Duttons. The old Hall of Hatton is no longer in existence, a modern farm house having been erected on its site. Of the five oaks mentioned by Ormerod, one fell in 1851. Huxley Manor is held by Randle Wilbraham, Esq., whose grandfather purchased it from the representatives of the Bruens. There are two Halls in the township, now occupied as farm houses, one called Upper Huxley Hall, and the other Lower Huxley Hall, which latter still bears the traces of its ancient grandeur. For particulars of these manors, consult Ormerod, Lysons, Sir Peter Leycester's Antiq., Henshall's Hist. of Ches., &c.

Rectors. The list of Rectors is given by Ormerod. In 1714, the Bishop became Rector, and the duties were performed by a perpetual Curate. The following is the list of Curates:—

William Calkin.
Griffith Gardner, who had been Curate to the last Rector, Mr. Prescott.
Geo. Briggs.
1770. G. Salt.
1774. Will. Bissell.*
1784. Isaac Riley.
J. Bateman, buried December 19, 1803.
1803. Jos. Bower, died November 21, 1844.
1844. J. Wilbraham Hill, M.A. November.

The Church. It is dedicated to St. Peter, and is thus noticed in the Charter of Hugh Lupus, in 1093, relating to the grants to St. Werburgh's Abbey, in the city of Chester, "Ricardus de Rullos dedit Ecclesiam et Decimam Wavertonæ." The church is

* From an old Churchwarden's Account Book, it appears that in the year 1783, there must have been some trouble on the part of the parish respecting Mr. Bissell, as we find—"Paid to Charles Dean, for looking after Mr. Bissell on the Sabbath Day, 1s. Spent about Mr. Bissell at Chester, six days, 2s. 3d. Spent when the parish met about Mr. Bissell, 4s. 3d." The writer has been informed that Mr. Bissell on one occasion jumped out of a window from the Rectory, and was afterwards lodged in a Lunatic Asylum.

unnoticed in Domesday Survey, and was therefore probably built between that Survey and the period here specified. The present church was probably built in the reign of Henry VII. The writer is indebted to the kindness of Sir Stephen R. Glynne, Bart., of Hawarden Castle, for the following observations on its architectural style, the result of two visits, one in 1832, the other in 1851—"and the condition of the church," says Sir Stephen, "was certainly very different at the two periods. Waverton has a nave, and a shortened chancel, with north and south aisles, and a lofty and handsome western tower. The latter is of good late perpendicular character, with a large west window of four lights, and a doorway having bold foliage and armorial shields in the spandrels. It is the great feature of the church, but contrasts rather unhappily with the low and inferior character of the body, which bears marks of having been chiefly constructed in a debased period, perhaps in the reign of Elizabeth. The nave has very low arcades dividing the aisles—on each side three arches, which are pointed but small—the piers octagonal. The northern arches are slightly stilted, and the capitals on this side have an ornament which resembles the nail-head. Over the arcades is a clerestory of square-headed windows. The roof of the nave and aisles are of very fair timber work, of the latter part of the 16th century. The present east wall is said to have been built in 1606.

"The church has received much improvement since the accession of the present Incumbent. The tower arch has been thrown open to the nave, and the interior put into a neat and becoming condition, which was not the case formerly."

There are four good toned bells, on the largest of which is written, "1615, C. L." A date is also on the second bell, with an inscription which the writer could not decipher, but on the fourth bell, bearing the same date, is

"IHESUS BE OUR SPEED.
W. R."

An original certificate of the Sheriff &c. of Cheshire, respecting the bells and plate in the churches of that county, anno 1548, communicated from the Records of the Augmentation Office, by John Caley, Esq., F.S.A., shews that at that period there were only two bells.

"Warton Churche in the hundred of Broxton,
Chalise & Patten j..a ring of bells ij."

The Living. Waverton is a Rectory, as well as perpetual Curacy, which is thus accounted for. When Chester became a separate See in 1541, the Archdeaconries of Chester and Richmond were assigned to it for a Diocese. A custom of great antiquity prevailed in the Archdeaconry of Chester, that the Bishop, who is also Archdeacon, in right of his See, should have for a mortuary* on the death of every clergyman dying therein, his best horse or mare, bridle, saddle, and spurs; his best gown or cloak, best hat, best upper garments under his gown and tippet; and also his best signet ring. (Cro. Car. 237.)

In 1755, it was enacted by statute 28 Geo. II. c. 6, that these mortuaries should cease, as tending greatly to impoverish the small provision which the clergy were able to leave for the support of their families, and that in lieu thereof, the Rectory of Waverton, after the next vacancy, should be appropriated to the Bishop of Chester for the time being. This took place during the episcopate of Bishop Keene, twelve years after, on the death of the Rev. John Prescot in 1767, from which time to the present, the Bishop of Chester, as Rector, has always received the tithes of the parish, while the duties are performed by a Perpetual Curate, appointed by the Bishop, at a yearly stipend of £60. About the year 1828, however, a purchase was effected from Queen Anne's Bounty, of 12s. 3r. 13p., in augmentation of the Incumbent's income, who also occupies the Glebe and Rectory House, which Bishop Gastrell states was built in the year 1716.

Valor Ecclesiasticus. The Living of Waverton is valued in the King's Book (Henry VIII., 1535) as follows —

R 23 06 08 Pr. A. 0 6 8 Syn 0 1 6 Tri 0 6 8

Terrier. There is an old Terrier painted on panels, in a frame in the church, which the writer discovered by the merest chance, when the church was undergoing extensive

* "*Morturium*," a gift left by a man at his death, to his parish church, for the recompense of of his personal tithes and offerings not duly paid in his life time. A mortuary was anciently called *saule-sceat* (soul-shot), which signifies *pecunia sepulchralis*, or *symbolum animæ*. After the conquest it was called *cors-present*, because the beast was presented with the body at the funeral. *Jacob's Law Dictionary.*

repairs in 1845, and which he had reprinted and restored.* It was set up November 3, 1756. The expense of this table was—"To Richd. Vickers, for painting the Table of Fees, £5 2 0; for setting up, &c., 3/."

Charities. The poor of Waverton seem to have been well cared for, but from gross negligence and unjust appropriation, much has been lost. The following table of benefactors is in the church:—

		£	s.	d.
1629.	Hy. Wright gave 6*l.* y. use, to be given yearly for ever..	6	0	0
1638.	Robert Farrer gave 10s. y^e^ use, do.	0	10	0
1642.	Peter Barns gave 10*l.* y. use, do.	10	0	0
1649.	William Catherall gave 3*l.* y^e^ use, do.	3	0	0
1654.	John Tilston, Esq. gave 20*l.* do. do.	20	0	0
1654.	William Pue gave 5*l.* do. do.	5	0	0
1662.	John Barker gave £2 11 6 do. do.	2	11	6
1661.	Tilston Bruen, Esq. gave £5 do. do.	5	0	0
1665.	Richard Moulson gave £10 do. do.	10	0	0
1674.	Peter Moulson gave £20 do. do.	20	0	0
1702.	Richard Mort gave £10 do. do.	10	0	0
1702.	Mrs. Elizabeth Dutton gave £30 do.	30	0	0
1707.	Richd. Rephson gave £5 y^e^ use ..... to the poor of Waverton only	5	0	0
1713.	Peter Moulson gave £5 do. do.	5	0	0
1724.	Robert Rollison gave £12 do. do.	12	0	0
		144	1	6

"Thos. Lightfoot, Jo. Iohnson, Church Wardens, Daniel Cassey, Sidesman, 1704."

It is stated that a part of this money was expended in the purchase of land, but there is no evidence on the subject whatever. About two acres in Tattersall, claimed by the Churchwardens, is supposed to have been the purchase made. There is an annual sum of £1 paid to the poor, being the interest on £20 formerly borrowed from the poor's money, to be expended on the Highways of the Township.

Clubs. At Huxley the farmers have instituted a Coal Club, for the benefit of the poor during the winter. There are two Clothing Clubs, the larger managed by the Incumbent, the other, a private one, instituted by Lord Henry Cholmondely, M.P., for the benefit of his cottage tenants at Hatton. The farmers have established a Cattle Club, which has been of great service.

Schools. Very little attention seems to have been paid to the education of the children at an early period. So late as 1787, there is an item charged upon the church rate for two dozen "Reading Made Easy's and ten Testaments, 19/6," divided among the three townships, and "£2 7s 0d. paid Benjamin Dutton, for 47 Sundays teaching." This seems to have been all that was paid for education at that time. In 1844, when the writer became Incumbent, there was no school connected with the church, except a few children collected by a Dame on Sunday mornings, who instructed them much in the manner of 1787. At present there are two Daily and two Sunday Schools in the parish, at extreme ends. The school at Waverton was built by the Marquis of Westminster, but when the children attain a larger growth, they are sent to the Endowed National School at Hargrave. The school at Huxley was built in 1851, through the assistance of the Lord of the Manor and others. This school is under Government inspection. It has been licensed, and was opened for divine service 12th March, 1852, when the late Chancellor Raikes preached. A Curate is supported by the Cheshire Rural Chapel Society and the Landed Proprietors, who performs two full services each Sunday.

A Church Missionary Association was formed at Waverton in 1848, from which period to 1854, the sum of £169 8s. has been paid to the Parent Society.

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* The Terrier is of the same nature as that of West Kirkby. Vid. p. 10*.

17*th May*, 1855. SCIENTIFIC SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. Thomas Warburton, of 122, Falkner Street, was duly elected a Member of the Society.

The following Donations were laid upon the table:—

From the Society. Proceedings of the Yorkshire Philosophical Society, volume I, 1855.

From Joseph Mayer, F.S.A., F.R.A.S. Notes upon some of the Antiquities of France, made during a fortnight's Excursion, in the summer of 1854. By Charles Roach Smith, F.S.A., 1855.

From T. T. Wilkinson, F.R.A.S. The Lady's and Gentleman's Diary for 1855.

Mr. Wilkinson exhibited a portrait of Robin O'Green, published at Lancaster in 1780. It represents him in the act of singing the ballad called the Burnley Haymakers, at the top of which is a rude but characteristic wood-cut.

Mr. Johnson exhibited a silver table spoon, the assay mark on which showed the date of it to be 1726. The bowl was of the usual size of the period. The top formed a signet, with the letters "T.T." united in a heraldic knot. It was found in 1850, in the township of Bridge Trafford in Cheshire, and is supposed to have belonged to Thomas Trafford.

Mr. Whitehead exhibited a piece of "meteoric iron," from the banks of the Yenissëi in Siberia. It was found by Pallas, and is described as part of a very large mass, 1770.

Mr. Buxton exhibited a MS Magazine, for the purpose of drawing attention to some most beautiful pen and ink etchings by Mr. William Stubs.

Mr. H. S. Fisher exhibited a large collection of dried plants, in illustration of his Paper, the reading of which was postponed.

The Secretary laid upon the table, a copy of the Reprint of Volume I., its price to Members will be five shillings.

The following Paper was then read:—

An Account of the Life and Writings of the late J. H. Swale, of Liverpool, by Thomas T. Wilkinson, F.R.A.S.

24*th May*, 1855. MISCELLANEOUS MEETING.

THE REV. DR. THOM, V.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. Thomas Comber, of Edge Lane, Liverpool, and Mr. Thomas Melling of Rain Hill, were duly elected Members of the Society.

The following Donations were laid upon the table:—

From John Mather, Esq. Improvements of the Liverpool Docks, by John Grantham, Consulting Engineer, pamph. 8vo. 1853; Fifth Annual Report of the Liverpool Chamber of Commerce, 1855; Report of the Proceedings on the Law of Partnership, by the Liverpool Chamber of Commerce, April 1st, 1854; Index to the Local Acts affecting Liverpool and its neighbourhood.

The Accounts of the Corporation of Liverpool with their Treasurer, 1834, '35 (two copies), '36, 38, 39, 40 (two copies), '41, '42, '43, '44, '45 (two copies), '46, '47.

The Accounts of the Trustees of the Liverpool Docks, 1836, '38, '39, '40, '41, '42, '43, '44, '45, '46.

Expenditure of Dock Committee, (1824-36), and Reports of the Dock Surveyor, 1836, '42, '43, '44, '45, '46.

Minutes of Proceedings before the Committee of the House of Lords, on the Birkenhead Dock Bill, 1844; Minutes of Evidence before the House of Commons, Birkenhead Dock Bill, 1844.

Minutes of Evidence taken before the Committees of the House of Commons and the House of Lords, on the Liverpool Dock Bill, 1844.

Report of the Police Establishment and the State of the Crime, with Tabular Returns, for 1842, '43, '44, '45.

Comparison of the Evidence on the Birkenhead Dock Bill in the House of Commons, 8vo. pamph. 1844.

Liverpool Dock Bill, 1844; Ditto with MS Alterations; Ditto, 1845: Act, 1845; Bill, 1848; Ditto with MS Alterations.

Mersey Conservancy Act, 1842.

Draft of Bye Laws for the Borough of Liverpool, with Supplements, 1836.

Liverpool Improvement Bill, 1842; Act, 1842; Bill, 1846.

Liverpool Fire Prevention Bill, 1843; Amended after first reading, 1843; Abstract of, 1843; Act, 1843; Bill, 1844.

Liverpool Health of Town and Building Regulations Bill, 1842; Act, 1842.

Liverpool Sanatory Bill, 1846 (two copies); Heads of ditto, 1846; Act, 1846.

Liverpool Borough Prison,—Approval of Inspector's Recommendations, 1847.

Liverpool Clergy Endowment Act, 1838.

Liverpool Borough Fund Act, 1840.

Manchester, Bolton and Bury Canal Railway Act, 1831; Ditto Canal and Railway Act, 1832; Inquiry into the Tonnage of Coal charged on the Canal Navigation, March, 1840; Supplementary Report, April, 1840; Report on the Charges to Railway Passengers, May, 1840.

Questions for circulation in populous Towns and Districts, issued by the Health of Towns Commissioners.

Return of the Annual Salaries received from the Corporation of Liverpool, (1836-'41), 1841; Second Report of the Special Committee of the Town Council, respecting the duties of the Officers of the Council, 1842; Statements of the Town Clerk, Deputy Town Clerk, and Clerk of Committees, in reference to ditto, Nov. 1842; Remarks read to the Council respecting their statements, 28th December, 1842.

Liverpool Watering Bill, 1843.

Report of the Borough Engineer on the general Business of his Department, June, 1847: Ditto interleaved with appendices.

Report of the Finance Committee on the Probable Income and Expenditure of the Corporation, 1847.

From the Society. Proceedings and Transactions of the Kilkenny Archæological Society, two parts, January and March, 1855.

From the Society. Proceedings of the Ashmolean Society, Vol. I. 1832-'42; Vol. II. 1843-'52, ad 1853, 1854, ditto.

From James Kennedy, Esq., LL.B., late H.M. Judge in the mixed Court at Havana. Question of the Supposed Lost Tribes of Israel, with Appendices on the six days of the Creation, and on the Chronology of the World, pamph. 1855. Probable origin of the American Indians, with particular reference to that of the Caribs, pamph. 1854.

From the Library Committee, Guildhall, London. A descriptive catalogue of the London traders' tavern and coffee-house tokens current in the 17th century. Presented to the Corporation Library by H. B. Hanbury Beaufoy, Esq., and edited by Jacob Henry Burn, Esq., second edition, 1855.

From Morris Moore, Esq. Protest and Counter Statement against the Report from the Select Committee on the National Gallery, pamph. 1855.

From Charles Roach Smith, Esq. Almanach suppute sur le meridien de Liege, par maitre Mathieu Laensbergh mathematicien, pour l' année 1851, 226e année. Opinions and Testimonies respecting the Museum of Charles Roach Smith, Esq.

From W. H. Dobson, Esq. A History and Description of the ancient houses in the market-place of Preston, with notices of their successive owners to the present time. Extracted from the Preston Chronicle, pamph. 12mo., 1855, two copies.

From Thomas Sansom, Esq. "The Events," a Liverpool newspaper, price ½d. No. 1, May 19th, 1855.

From James Boardman, Esq., the author. History and Description of the Barberini or Portland Vase, with illustrations, pamph. 8vo. 1855.

From D. Buxton, Esq., editor. Flowers Freshly Gathered, a selection of original Poetry, 12mo., 1853.

From R. A. Macfie, Esq. A Letter to the Evangelical Alliance on Brother-Love, 1847; Short Practical Hints on the means of inducing, combining, and directing Missionary Efforts, respectfully inscribed to the Presbyterian Church in England, 1842.

From W. Bean, Esq., Liverpool, Francis Brent, Esq., Folkstone, and Thomas Sansom, Esq., F.L.S., Liverpool. Several Parcels of Plants for the formation of a Herbarium.

Mr. Macfie exhibited an ancient MS copy of the Scriptures, with ornamented capitals, &c. It is supposed to belong to the 14th century.

Mr. Sansom exhibited a photograph of a monumental inscription. It was one sixteenth of a square inch in area, and contained nineteen lines, the whole of which could be easily read by the microscope. Each letter was the one thousandth part of an inch in height. It was prepared by Mr. B. Dancer, of Manchester, and could be read with a comparatively low power.

Mr. Thomas Gray exhibited several copper coins, apparently inserted in stone. They were taken from the oyster-beds of Kent, where they had been obviously deposited by shipwreck. Several of them were East India coins, and on one the date 1803 was visible.

Mr. Fisher again exhibited the contents of a large Herbarium, as illustrative of his paper.

The Chairman drew attention to a passage in one of Heylin's Works, from which it appeared that the Cathedrals of England are of two classes, thirteen being of the old or secular foundation, and the remainder having been founded by Henry VIII., principally on the dissolution of the monasteries.

The following Papers were then read:—

Remarks upon the Flora of Liverpool, by H. S. Fisher; On the Illumination of the Diatomaceæ when viewed under the Microscope, by Thomas Sansom, A.L.S., F.B.S.E., &c.; and the CONCLUDING ADDRESS, *by Dr. Hume, Hon. Sec.*

At the close of the business of another Session, to which every friend of the Society looked forward with much interest, the Council have requested me to lay before the Members some considerations of a general kind, such as our present position seems to require. I have at once accepted the responsibility of doing so;—believing that we have always a tendency to lose sight of general principles in the details of papers on specific subjects; and also that it is a mark of wisdom to notice favourable facts, for the purpose of exciting a frequent imitation of them, and unfavourable facts,—whether of action or omission,—to secure their avoidance in future.

Our present position is somewhat peculiar. We have been for seven years before the public, and numerous gratifying testimonies have been borne to the zeal and success of our labours. We have also, since the date of the Society's inauguration, had proofs of local interest which have steadily increased;—each list of members has been larger than the preceding one, and we have no reason whatever to suppose that the standing number has yet been reached. It is only during the session which is now closing, however, that the principal members of the Society have been able to satisfy themselves respecting the general arrangement of the business, or to occupy the whole, or indeed any large portion of the ground which they had originally marked out. The past session, therefore, as I may now almost venture to call it, has afforded a more correct representation of the Society's character than any previous one; the degree of success which has attended it is

a better measure of our actual capability; and the volume which is now in preparation will exhibit our whole design and general objects, more truly than any which the members or the public have yet had an opportunity of seeing.

On comparing the first printed List of the Society with the present one, two facts arrest the attention at the same time,—the number of valuable members which the Society has lost, and the still greater number which it has gained. In the removal of the former, Death has gathered in a large harvest, some of the most valued of our original members being gentlemen full of years, whose names had been familiar to the public, and held in high esteem. Others have been separated from us by those accidents which are inseparable from a great commercial community, so that we find those whose names are in our first list, in almost every part of the world, including the remotest colonial possessions of the United Kingdom. It thus happens, that, at the close of seven years, exactly one-third of the enlarged Society consists of original members; and that two-thirds who have joined them,—inspired with the same sentiments and giving earnest more or less of future promise,—have in some degree "entered into the labours" of their predecessors. In noticing our present position, therefore, it is absolutely necessary to allude to first principles, and thus to glance slightly at the past. It may also be well to direct our attention, by anticipation to the future.

The great general object which the founders of the Society had in view, may be expressed in a variety of ways. It was to collect and classify material objects, and to procure information respecting persons, places, and things,—all of which should be illustrative of the two Counties of Lancashire and Cheshire. The publication of results followed as a matter of course; for without this, members who were widely scattered could not be instructed; and others who were ready to assist would be without examples for guidance. It was hoped that the volumes of the Society would in time be a valuable storehouse of materials, for the future historian of the counties, or of any portion of them; and that his task would merely be that of moulding the metal, which we had collected in the ore and prepared for use.

It is evident, however, that though the geographical "extension" of the Society was not great, the intellectual "comprehension" exhibited great variety. Whatever subjects it was proper for a local historian to treat of, it was proper for us to investigate; including such subjects as local meteorology and topography, antiquities, statistics, the biography of distinguished individuals, abstract science and its practical applications, the results of observation and experiment, the nature of the people and their characteristics, natural or acquired.* In the first paper that ever was read to the Society, the following passage occurs:—

"Our basis of operations is anything but narrow, for it embraces every subject of historic interest in a given locality. We are circumscribed only in *area*, and that partly from choice and partly from necessity; but it is difficult to conceive of a Society more comprehensive in its general principles and its details. It is not, for example, a mere Documentary Society, nor is it Archæological alone, nor Genealogical, nor Topographical. It is not confined to any branch of Natural History, nor to the whole subject; it is not a mere depository of Folk-lore, or a recorder of facts respecting Battles, Churches and Ships. With every one of these subjects, aye and with every other, it claims a connexion; in so far, and only so far as they tend to illustrate the two counties of which this town is in some respects the natural centre."

During the first three years of the Society's operations, it was sufficiently clear, that there were both materials in abundance, and earnest willing labourers. Of the eleven subjects which are enumerated in the original prospectus, almost every one had met with some elucidation, while the greater number might be said to indicate whole classes of papers. Even of the more detailed subjects, enumerated in an early and special publication of the Society, a very large number had met with attention,—but this seemed to be rather the result of

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* The proposer of the first resolution at the meeting at which the Society was founded, expressed himself thus:—"I can fancy that some will at first believe our objects to be too varied; that they will see little harmony or congruity between natural history and architecture, traditions and parliamentary papers, ancient pedigrees and modern manufactures. Let it be borne in mind, however, that all these come within the field of inquiry of the historian; for this is the reason why we cannot omit a single item of our programme."

accident than design. The Society had not yet taken any pains to classify its subjects or to give to each a special evening;—and thus there was a danger that some subjects would receive undue attention at the expense of others. Indeed, this fact actually occurred. Four years ago, the following language was used in the Concluding Address:—

"It has been assumed not only by strangers but by some of ourselves, that our inquiries are exclusively of an archæological or antiquarian character; and some gentlemen who would gladly have sought a connexion with us, have kept aloof, from the supposed narrowness of our basis. Now it is important to correct an impression so erroneous. We embrace every subject in which the historian is supposed to take an interest,—in short, every local subject which is worthy of a permanent record."

It is only necessary to say that this error has since been remedied. The systematising of the inquiries of the Society, which took place last autumn, brings before us in order each of our great subjects; and there is no reason that any department or branch of these should suffer systematic neglect. The extension of the Society too, enables us to read and discuss papers, occasionally, of an abstract character, or which are in no respect related to the soil of our two counties. The importance of this last arrangement will be evident, when I state that some of the most valuable papers which have come before the Society this session, respecting inventions, manufactures, and philosophical observations in Lancashire and Cheshire, would actually have been inadmissible under our old laws, except by an alteration of title which would have made the whole appear ridiculous.

The Session which is just closing has presented a degree of uniform success far exceeding the most sanguine expectations of the warmest friends of the Society. It has also solved several difficulties and given a practical reply to many doubts and objections.

One of the first was, that the meetings would be too numerous, and that it would not be possible to obtain a supply of valuable matter for them all. The answer is, that we have had more than sufficient for twenty-one meetings; for, after reading twenty-one formal papers and fourteen contributions of a less formal character, we have been under the necessity of postponing about fifteen papers, some of which were ready and in hand, while others were only in preparation.

Another objection was, that the arrangements are too artificial, and that it is impossible for the members to cultivate Literature, Science, and Archæology, in exactly an equal degree. It should be borne in mind, however, that each of these terms is relative and expansive, but not of absolute limitation; so that what some call Science others call Literature, e.g. philology, statistics, topography, and ethnology. Our laws also provide for the equalisation of the supply in special cases, but nothing of the kind has been necessary, as papers on all the three subjects have been read during the miscellaneous Meetings.

It was also objected that the members would not attend meetings so frequently held, and that the attendance would be occasionally very limited. This prediction has certainly not been verified, for during no former Session were the meetings so well attended, nor did they excite so lively an interest. For this, various reasons may be assigned, e.g., that the place of meeting is more central, the members are greatly increased in number, and the evenings of meeting are so distinct, and so well known, that arrangements can easily be made for attending them.

It is important to state, at the same time, that the papers have not deteriorated in character; on the contrary, several gentlemen of acknowledged eminence in their several departments, have given us aid of great value. Indeed a practical difficulty is to know how we can do justice to all the authors of papers without making our volume larger than prudence warrants. In another department, which does not so readily arrest the attention, the Society has made some progress. Every meeting has brought some addition to the Library, and occasionally to the Museum. On one or two occasions these have been very large; and even on this last evening of the Session, donations have been laid upon our table, more valuable in quantity, variety, and intrinsic worth, than some of our local societies are accustomed to receive in the course of the whole year. One donation, of great value, consists of parcels of plants for the formation of a herbarium, from Mr. Brent of Folkstone, and Messrs. Bean and Sansom of this town. Mr. Sansom has also kindly undertaken to mount them, and to have them ready for reference by the commencement of next Session.

The future progress of the Society may be anticipated from a consideration of the difficulties already overcome, and from the arrangements which have been entered upon for permanent guidance. One of the most important of them is a provision made in the laws for placing an *Annual Volume* of Proceedings and Papers in the hands of every member. Of course it will vary, from time to time, in magnitude and interest, but it will be a regular register of our labours, and will keep in useful exercise the knowledge and interest of the members and other friends. Several societies, which in past years seemed not to feel the value of regular publication, have at length entered upon it, and one has just brought up an arrear of eighteen years in its first publication, while another devotes two volumes to twenty-one years.

It may naturally be supposed that a society, which has its centre at one great town of a district will illustrate that immediate neighbourhood with great or even unnecessary minuteness; while many other points of equal importance will, from the absence of investigators, be comparatively unnoticed. Perhaps it is impossible to avoid this difficulty altogether; but in our case it exists only in a small degree. We have members in almost every part of the two counties, and writers of papers even where we have not members; and even those who are resident in or near Liverpool refer their local information and associations to points considerably remote. At present about three-fifths of the members reside within seven miles of the Town Hall; yet, during this seventh session, half the papers have been contributed by persons non-resident; and of the remainder, some have no reference to Liverpool or its immediate neighbourhood.

It is hoped that this will be the case in a still more marked degree, when Mr. Danson's paper and the General Statement which accompanies it have received a wide distribution. It exhibits, in detail, numerous subjects, in connection with which many gentlemen may be able to assist us, and no doubt a large number will generously and kindly render their aid, in a cause of public usefulness, but of no individual benefit. In treating of places of limited extent, or of places which do not afford much matter, some of those papers may be exhaustive in their character, but in general they will be valuable, not merely for their positive information, but from being suggestive to the readers of them.

It should not be supposed, however, that all the papers will be printed as a matter of course. In former years this has nearly been the case, from the excellence of the matter and from the quantity supplied; but in future years the matter may vary widely in quality, while it will undoubtedly be abundant in quantity. The members will therefore expect the Council to exercise a wise discretion.

It is possible, too, to improve the character of our meetings. The objects which are exhibited, from time to time, should always be of interest; for it is obviously trifling with the time of a Learned Society to occupy its members and visitors with the examination of things which are neither rare, nor curious, nor illustrative. In strict order, a notice should be sent to the Curator, of objects to be brought before the meeting; there would then be some guarantee that they were thoroughly deserving of attention. In the matter of miscellaneous communications, also, I may remark, that they might be more frequent and more varied than they have hitherto been. It is a mistake to suppose that papers should necessarily be of any fixed length, they should merely express, fully and explicitly, what the writer has to say. They will, therefore, be very varied in magnitude, and those which are shortest or longest may, in certain cases, be those of most interest.

The conclusion of a session of so much interest is not without a feeling of melancholy, in which I am sure many of the members will participate. It is, at the same time, a relief to those who have occupied positions of prominence; nor will their labours cease with the termination of the meetings. Less than three months will probably suffice to place in the hands of the members another volume; and the recess on which we are all entering will afford new opportunities of prosecuting valuable researches, or of arranging accumulated materials. Let us part in the hope of meeting in October next, not merely to sustain, but to extend the character and usefulness which have thus far crowned our labours.

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FINIS.

HISTORIC SOCIETY

OF LANCASHIRE AND CHESHIRE.

This Society was founded June 20th, 1848, at a public meeting, held in the Collegiate Institution, Liverpool, the Worshipful the Mayor in the Chair. Its original Object was, by collecting, arranging, and publishing, to illustrate all such subjects as are connected with the General History of the two counties.

The objects and operations of the Society were extended, from local and special to general, August 30th, 1854; so that it now covers the whole field of intellectual inquiry. The principal subjects have been classed under the following three general heads:—

I.—ARCHÆOLOGY;—including Archæology in general, with a particular reference to the History and Antiquities of Lancashire and Cheshire.

II.—LITERATURE;—including Literature, Criticism, and the Fine Arts; with Topography and Statistics.

III.—SCIENCE;—including Abstract Science, Natural History, Experimental Philosophy, and Practical Mechanics.

Besides the usual officers, there are eighteen ordinary members of Council. These are divided into three Committees of six each, corresponding with the three sections, and having charge of Archæology, Literature, and Science respectively. Each of the Sections meets monthly during the Session, i.e., from the 18th of October to the middle of May. Meetings are also held, from time to time, of a MISCELLANEOUS character; to afford opportunity for brief descriptions of objects illustrative of antiquity, natural history, arts, manufactures, manners and customs; for the reading and discussion of papers connected with more than one of the sections; and for the introduction of subjects of general interest, at which an unusually large number of visitors might desire to be present.

Since the Society was founded, it has issued a volume of Transactions annually; and by the present Laws, *it must continue to do so.* From the voluntary labour expended in their preparation, the intrinsic value of the matter, and numerous donations of plates from members and others, these volumes have attracted considerable attention, and have given a much greater return to the members than the amount of subscription would otherwise have entitled them to.

During the short period of seven years, the Society has succeeded in forming an interesting LIBRARY and MUSEUM. The Town Council have kindly expressed their readiness to set apart sufficient space for both, so soon as it can be spared, in connection with the Free Public Library and Museum. The collection is very varied in character; embracing Books, Manuscripts, Maps, Autographs, Drawings, Prints, Paintings, Antiquities, Curiosities, Articles of Manufacture, Objects of Natural History, Models, Specimens of Ancient and Mediæval Art, &c., &c.

The Members of the Society pay on election an Entrance Fee of a Guinea. *Resident* Members, (viz. those having addresses in Liverpool, or residing within seven miles of the Town Hall,) pay a subscription of a Guinea annually, and *Non-resident* Members of Half-a-Guinea. Any one may become a Life Member by paying ten such Subscriptions, exclusive of the Entrance Fee, in a single sum.

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T. BRAKELL, PRINTER, LIVERPOOL.

TRANSACTIONS

OF THE

HISTORIC SOCIETY

OF

LANCASHIRE AND CHESHIRE

VOLUME VIII.

SESSION 1855-56.

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1856.

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This Volume, like all the preceding ones, has been edited by the Honorary Secretary, under the direction of the Council. The writers of Papers, however, are alone responsible for the facts and opinions contained in their respective communications.

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EXPLANATORY NOTE.

Of the Sixteen illustrations contained in this volume, only eight have been produced wholly at the cost of the Society. These are I, IV, V, VI, VII, VIII, IX, X.

Nos. II and III were presented complete, by Mr. Marsh, in illustration of his own paper.

No. XVI was in like manner presented complete, by the Rev. John James Moss, M.A., in illustration of his own remarks on Watches.

The use of the Plates XI, XII, XIII, XIV and XV was granted by the British Association for the Advancement of Science, through Professor Phillips. The use of the standing forms, for printing the Tables to which these plates refer, was granted in like manner by the British Association. (*See page* 212.)

This portion of the printing was executed by Messrs. Taylor and Francis, London.

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Major-General The Hon. Sir EDWARD CUST, K.C.H., D.C.L., F.R.S., Leasowe Castle.

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The HIGH SHERIFF OF LANCASHIRE.	JOHN T. DANSON, F.S.S.
The HIGH SHERIFF OF CHESHIRE.	JOHN HARTNUP, F.R.A.S.

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Assistant Secretary.

THOMAS G. WEDGWOOD, Esq.

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*In accordance with Law XX, the Council added the following members from the Society to the Sectional Committees:—

ARCHÆOLOGY—Messrs. W. Blackmore, J. N. Crosse F.S.S., Henry Johnson, and James Stonehouse.

LITERATURE—Messrs. H. A. Bright, William Burke, Alfred Hunt, and Alex. MacIlveen.

SCIENCE—Messrs. William Bean, George M. Browne, Henry Canty, and William Milner.

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Those whose names are printed in SMALL CAPITALS are Members of the Council; and in *italics* are Life Members.

Those marked thus * are Resident. The post town Liverpool is usually omitted.

A

18th Oct., 1854. Abraham, Rev. Thomas Edward, M.A., Bickerstaffe, Ormskirk.
23rd Nov., 1848. *Ainslie, Montague*, Grizedale, Hawkshead, Lancashire.
23rd Nov., 1848. *Alexander, William L., 4, Mount Vernon Green, and 2, Harrington Street.
6th Dec., 1855. *Allcard, William*, Bank House, Warrington.
18th Sept., 1854. *Allport, William, Merton Cottage, Bootle.
10th Feb., 1853. *Anderson, Robert Worrall, 23, Falkner Square.
3rd May, 1849. *Anderson, Thomas Francis, Holly Lodge, Fairfield, and 3, Cable Street.
23rd Nov., 1848. Ansdell, Richard, 7, Victoria Road, Kensington, London.
15th Sept., 1854. Arrowsmith, P. R., The Ferns, Bolton.
14th Sept., 1854. *Arthure, Rev. Benedict, B.A., Tranmere.
11th May, 1854. Aspland, Rev. R. Brook, M.A., Dukinfield, Ashton-under-Lyne.
14th Dec., 1848. *Astley, John, 18, Salthouse Dock, and Rock Ferry, Cheshire.
4th April, 1850. Aston, Walter, Chadderton Hall, and Blue Boar Court, Cross Street, Manchester.
P. 9th Oct., 1854. Atherton, Henry, Sutton, Prescot.
8th Nov., 1849. Atkinson, Fenton Robinson, Oak House, Pendleton, Manchester.
23rd Nov., 1848. *AVISON, THOMAS, F.S.A., Fulwood Park, Aigburth, and 16, Cook Street, TREASURER.

B

23rd Nov., 1848. *Badnall, Rev. William, M.A., Wavertree.
P. 23rd Nov., 1848. *Baines, Thomas, Oakfield, Little Woolton.

8th June, 1854. *Banning, John Johnson, 20, Castle Street.
15th Dec., 1853. Barlow, T. Worthington, F.L.S., St. James's Chambers, Manchester.
Mayor Man., 1851-53. Barnes, Robert, Brookside, Manchester.
13th Dec., 1855. Barton, Henry Campbell, Fishergate, Preston.
6th Dec., 1855. *Batty, Edward, 34, Stafford Street.
23rd Nov., 1848. *Baylee, Rev. Joseph, D.D., Principal of St. Aidan's College, Birkenhead, Claughton Road, Woodside.
P. 6th Dec., 1849. Beamont, William, Warrington.
30th Dec., 1854. *Bean, William, Revenue Buildings, and 21, Wellington Road.
10th Sept., 1854. *Bedford, James, Ph.D., Fort Terrace, New Brighton.
23rd Nov., 1848. *Bell, Henry, 16, North John Street, and Grosvenor Road, Claughton, Birkenhead.
6th April, 1854. Bell, John Gray, 11, Oxford Street, Manchester.
15th Nov., 1854. *Belshaw, John, Wason Buildings, 4, Harrington Street.
P. 9th Dec., 1852. *Benn, Edward, Vauxhall Distillery.
23rd Nov., 1848. *Bennett, William, 109, Shaw Street.
Mayor Li., 1850-1. *Bent, Sir John, 1, Rake Lane, Edge Hill, and 30, Johnson Street.
23rd Nov., 1848. *Bickersteth, Robert, 2, Rodney Street.
7th March, 1850. Birch, Sir Thomas Bernard, Bart., The Hazles, Prescot.
23rd Nov., 1848. Birchall, Thomas, Ribbleton Hall, Preston.
23rd Nov., 1848. *Bird, William, 9, South Castle Street, and the Dell, Rock Park, Rock Ferry.
4th March, 1852. Birley, Rev. John Shepherd, Halliwell Hall, Bolton.
P. 8th Jan., 1852. Birley, T. Langton, Carr Hall, Kirkham.
6th Dec., 1855. Black J., M.D., F.G.S., Southport.
20th Sep., 1854. *Blackmore, William, 2, Exchange Street, East, and Sutton, Cheshire.
23rd Nov., 1848. Blackburne, John Ireland, The Hall, Hale.
1st Sep., 1854. *Blakeney, Rev. John, B.A., Oxton.
26th Sep., 1854. Bloxam, Frederick William, Alliance Bank, Threadneedle street, London.
23rd Nov., 1848. *Blundell, Thomas Weld, Ince Blundell, Great Crosby.
P. 15th Dec., 1853. *Boardman, James, Sailors' Home, and Huskisson street.
P. 30th Dec., 1854. Bööck, Frederick Robert Paul, 86, Newman Street, Oxford Street, London.
5th May, 1853. Booth, Benjamin Witham, Swinton, Manchester.
1st May, 1856. Booth, John Billington, Preston.
15th Dec., 1853. *Bossi, Arthur, 9, Rumford Place.
31st Sep., 1854. Bostock, Rev. H., M.A., Grammar School, Warrington.
3rd Jan., 1856. *Bouch, Thomas, 1, Old Hall Street, and New Brighton.
23rd Nov., 1848. *Boult, Francis, Rumford Place, and Clifton Park, Birkenhead.
P. 23rd Nov., 1848. *Boult, Joseph, Harrington Chambers, and Grove Park, Lodge Lane.
8th Dec., 1851. Bourne, Cornelius, Stalmine Hall, Preston
6th Dec., 1855. Bowes, John, Blue Coat School, Warrington.
29th Dec., 1854. *Boyd, Andrew, 21, Nile Street.
6th April, 1840. *Brackley, the Viscount*, M.P., Worsley Hall, Manchester.
13th Nov., 1851. Brackstone, R. H., Lyncombe Hill, Bath.
15th Dec., 1853. Bradbury, Charles, Salford Crescent, Manchester.

23rd Nov., 1848. *Brakell, Thomas, 7, Cook Street, and 23, Richmond Terrace, Everton.
30th Dec., 1854. Brent, Francis, Custom House, Folkstone.
9th March, 1854. *Bright, Henry Arthur, Sandheys, West Derby, and 1, North John Street.
3rd May, 1849. Brooke, Henry, Forest Hill, Northwich.
6th March, 1851. *Brooke, Richard, jun.*, Norton Priory, Runcorn.
13th Sep., 1854. *Brounlie, Charles, 19, Tower Chambers.
23rd Nov., 1848. **Brown, William, M.P.*, 7, Chapel Street, and Fenton's Hotel, London.
6th Jan., 1853. *Brown, Rev. Hugh Stowell, 118, Chatham Street.
23rd Sep., 1854. *Brown, John*, F.R.G.S., F.R.S., of North Antiq. Copenhagen, 3, Newcastle Place, Clerkenwell Close London.
15th Mar., 1855. *Browne, G. Mansfield, 15, South Hill, Park Road.
11th Sep., 1854. *Burke, William, 160, Grove Street.
17th Sep., 1854. Burnell, Rev. Samuel, M.A., Winwick, Warrington.
Mayor La., 1853-4. Burrell, John Stamp, Lancaster.
9th Dec., 1852. Bury, Edward, F.R.S., Sheffield.
P. 15th Dec., 1853. *Buxton, David, Principal of the Liverpool Deaf and Dumb Institution, Oxford Street.
2nd Nov., 1854. Buxton, Edward, Principal of the Cambrian Deaf and Dumb Institution, Swansea.
23rd Nov., 1848. *Byrne, Andrew Euing, 30, Hackin's Hey, and 8, Kenyon Terrace, Claughton, Birkenhead.

C

23rd Nov., 1848. *Caine, Nathaniel, 12, Dutton Street.
6th Dec., 1855. Calvert, F. Crace, F.C.S., M.R.A. Turin, Royal Institution, Manchester.
23rd Nov., 1848. *Campbell, Rev. Augustus, M.A., The Vicarage, Childwall, and 131, Duke street.
8th Jan., 1852. Campbell, Rev. Colin,‖ M.A., St. Thomas's, Lancaster.
4th April, 1850. *Carlisle, His Excellency the Earl of*, Lord Lieutenant of Ireland, The Castle, Dublin.
23rd Nov., 1848. *Carson, Thomas, Talbot Chambers, Fenwick street, and 3, Northumberland Terrace, Everton.
6th Dec., 1849. *Casson, William, 39, Parliament street, and 3, Great George square.
27th Sep., 1854. *Casey, George, Naylor Street, and Walton.
26th Sep., 1854. *Cauty, Henry John, 31, Norton street.
H.Sh. Chesh., 1855-6. *Chapman, John*, Hill End, Mottram-in-Longdendale.
14th Sep., 1854. *Chantrell, G. F., 150, Dale street.
Cheshire, the High Sheriff of, Vice-President, *ex officio*. (Richard Naylor, Esq., Hooton Hall.)
2nd June, 1853. *Chester, the Lord Bishop of*, the Palace, Chester.
23rd Nov., 1848. *Clare, John Leigh, Richmond Terrace, Breck Road, and 11, Exhange Buildings.
P. 23rd Nov., 1848. Clayton, Rev. George, M.A., Warmingham Rectory, Middlewich.
P. 12th Jan., 1854. *Clements, John, 6, Colquitt street.
10th Nov., 1854. Colston, Rev. John, Quarry Bank, Wilmslow, Cheshire.

‖ Dead, 1856.

1st Feb., 1849. *Colton, John Caspar, 7, Oldhall street, and Rainhill.
24th May, 1855. *Comber, Thomas, 33, Edge lane.
23rd Nov., 1848. *Conway, John, Cable street.
8th Sep., 1854. *Cornish, Thomas, 7, Sugnall street.
23rd Nov., 1848. Coulthart, John Ross, F.S.A. Scot., Mayor of Ashton-under-Lyne, Croft House, Ashton.
31st Oct,, 1854. *Cox, Henry, 15, Exchange Alley North.
6th Dec., 1849. *Crosfield, Henry, 4, Temple Place, and Edgemount, Edge Lane.
6th Dec., 1855. *Cross, James L., 6, Sandon Terrace.
1st Mar., 1855. *Crosse, John Norman, F.S.S., 15, Myrtle street, and 2, Exchange Chambers.
23rd Nov., 1848 Crosse, Thomas Bright, Shawe Hill, Chorley.
2nd May, 1850. Crossley, James, F.S A , President of the Chetham Society, Booth street, Manchester.
23rd Nov., 1848. *Cunningham, John, F.G.S., Hon. Mem. Roy. Corn. G.S., Cook st., and Beech Bank, Liscard, Cheshire.
P. 23rd Nov., 1848. *CUST, MAJOR-GEN , the HON. SIR EDWARD, K.C.H., D.C.L., F.R.S., Leasowe Castle, Cheshire, and Hill street, London, PRESIDENT.

D

8th Dec., 1851. Dale, Rev. P. S., M.A., Mytholme Lodge, Hollins Green, Warrington.
8th Dec., 1851. *Dale, Robert Norris, 2, Hargreaves' Buildings, Exchange, and 1, Richmond Terrace, Breck Road
23rd Nov., 1848. Danby, Rev. Francis Burton, M.A., County Asylum, Lancaster.
P. 29th Dec., 1851. *DANSON, JOHN TOWNE, F.S.S., Carnsdale House, Barnston, Birkenhead, VICE-PRESIDENT.
6th Feb., 1851. Darlington, Richard, Wigan.
23rd Sept., 1854. *Davies, Comenius, 134, Paddington, Edge Hill.
6th March, 1856. *Daw, Robert, F.B.S.E., &c., 26, Sandon street.
P. 23rd Nov., 1848. Dawes, Matthew, F.S.A., F.G.S., Westbrooke, Bolton.
10th Feb., 1853. Dawson, Pudsey, Hornby Castle, Lancashire.
23rd Nov., 1848. *_DAWSON HENRY_, 20, Redcross street, and 14, St. James's Road.
2nd May, 1850. *Dawson, Thomas, Rodney street.
23rd Nov., 1848. Dearden, James, F.S.A., Upton House, Poole.
6th April, 1850. De Tabley, The Lord, Tabley Hall, Cheshire.
7th May, 1851. *_Dickinson, Joseph_, M.A., M.D., F.R.S., F.L.S., M.R.I.A., 5, Nelson street.
P. 20th Dec., 1855. Dobson, William, Chronicle Office, Preston.
P. 7th March, 1853. *Dove, Percy M., F.S.S., F.I.B.A., Royal Insurance Office, 1, North John street, and 49, Hamilton Square, Birkenhead.
23rd Nov., 1848. *Duarte, Ricardo Thomaz, 2, Royal Bank Buildings.
13th Sept., 1854. *Duncan, Thomas, 18, West Derby street.
23rd Nov., 1848. *Dunlevie, Charles Thomas,

E

9th Dec., 1852 Eckersley, Thomas, Wigan.

8th Dec., 1851. *Edgar, James, Revenue Buildings, Custom House.
25th Sept., 1854. *Edmondson, Henry, 4, Stafford street.
P. 23rd Nov., 1848. *Egerton, Sir Philip de Malpas Grey*, Bart., M.P., F.R.S., F.G.S., Oulton Park, Tarporley.
23rd Nov., 1848. *Ellesmere, the Earl of*, F.R S, F.S.A, F.L.S., F.G.S., Worsley Hall, Manchester, and 18, Belgrave Square, London.
3rd March, 1853. *Ellis, William, 28, Kensington.
6th Dec., 1855. *Estill, Edward, 9, Orange Court, Castle street.
23rd Nov., 1848. *Evans, Edward, 52A, Hanover street.
15th Sept., 1854. *Evans, H. Sugden, F.C.S., 52A, Hanover street.
8th Nov., 1849. *Evans, Thomas Bickerton, 52A, Hanover street.
23rd Nov., 1848. *Ewart, Joseph Christopher, M.P., 64, Pall Mall, London, and New Brighton.
6th May, 1852. *Ewart, William*, M.P., 6, Cambridge Square, Hyde Park, London.
7th Feb., 1850. Eyton, Peter Ellis, Town Hall, Flint.

F

23rd Nov., 1848. Feilden, John, Mollington Hall, Chester.
11th Sept., 1854. Ferguson, William, F.L.S., F.G.S., F.R.G.S., 1, Torrington Square, London.
23rd Nov., 1848. *Finlay, William, Collegiate Institution.
23rd Nov., 1848. *Fisher, William M., Ph.D., F.R.A.S., 39, Great George street.
6th Dec., 1849. *Fleming, Thomas, 22, Sandon street, and 58, Castle street.
5th Dec., 1850. *Forster, Wilson, Willow Bank, Anfield, West Derby, and 36, Dale street.
23rd Sept., 1854. *Forwood, T. B., 33, North John Street
15th Dec., 1853. Franks, Augustus Wollaston, M.A., F.S.A., British Museum, London.
6th Jan., 1853. *French, Gilbert James*, Corr. Mem. S.A Scot., Bolton.

G

14th Dec., 1848. *Gardner, Richard Cardwell, Colonial Buildings, 34, Dale Street, and Newsham House.
15th Dec., 1853. *Gardner, Rev. Thomas, M.A., Stanley.
30th Dec., 1854. Garner, Charles,|| Queen Street, Cheapside, London.
31st Oct., 1854. Garner, James Pepper, Queen Street, Cheapside, London.
3rd May, 1849. Garnett, William James, Bleasdale Tower, Garstang.
23rd Nov., 1848. *Gaskell, John, Exchange Court, Exchange Street East.
7th Feb., 1850. *GATH, SAMUEL, 137, Finch Street.
7th March, 1850. *Gill, Robert, 1, Chapel Street, and Much Woolton.
9th Dec., 1852. *Graves, Samuel Robert, 13, Redcross Street.
7th Feb., 1850. *Gray, John, 16, St. Clement's Terrace, Windsor, and 25, Strand Street.
21st Sep., 1854. Gray, Rev. R. H., M.A., Kirkby, Prescot.

|| Dead, 1856.

14th Dec., 1848. *Gray, Thomas, Royal Insurance Office, 1, North John Street.
6th Feb., 1851. Gray, William, Wheatfield, Bolton.
20th Dec., 1855. *Grazebrook, George, 40, Canning Street.
7th Feb., 1850. *Green, Robert Molyneux, 14, Rupert Lane, Everton.
16th Sep., 1854. *Green, Thomas, 34, Chapel Street.
23rd Nov., 1848. Greenall, Rev. Richard, M.A., Incumbent of Stretton, R.D., Stretton, Warrington.
23rd Sep., 1854. Greene, John Stock Turner, the Hallhouse. Leigh.
31st Aug., 1854. Grenside, Rev. William Bent, M.A., Melling Vicarage, Lancaster.
8th Nov., 1849. *Guyton, Joseph, 10, Bridson Street, Falkner square.

H

20th Sep., 1854. Hadwen, Joseph, Fairfield, near Manchester.
2nd May, 1850. *Hall, William, Seaforth.
Mayor La. 1852-53. Hall, John, Lancaster.
25th Sep., 1854. *Hamilton, Rev. Charles J., B.A., Hemingford Terrace, Birkenhead.
8th Dec., 1851. *Hammond, William John, 50, Stafford Street, and 27, Lord Street.
23rd Nov., 1848. Hampton, Rev. H. M.A., 3, Lowther Cottages, Holloway, London.
19th April, 1855. *Harding, Augustus, 25, Chapel Walks, South Castle Street.
30th Dec., 1854. *Hardman, J. W., B.A., South Hill Place.
P. 6th Mar., 1856. Hardwick, Charles, Preston.
P. 8th Nov., 1849. Harland, John, F.S.A., Guardian Office, Manchester.
5th May, 1853. Harrison, William, Rock Mount, St. John's, Isle of Man.
12th Jan., 1854. *Harrison, William*, Galligreaves House, Blackburn.
9th Dec., 1852. *Harrison, Henry Walter, 5, Rodney Street, and 27, Castle Street.
9th Feb., 1854. *Harrowby, the Earl of*, D.C.L., F.R.S., Sandon Hall, Staffordshire, and 39, Grosvenor Square, London.
10th Feb., 1853. *Hartley, Jesse, Derby Road, Bootle, and Dock Office.
10th Feb., 1853. **Hartley, John Bernard*, Aigburth, and Dock Office.
P. 11th Oct., 1854. *Hartnup, John, F.R.A.S., Observatory, Vice-President.
23rd Nov., 1848. Hawkins, Edward, F.R.S., V.P.S.A., F.L.S., British Museum, London.
22nd Sep., 1854. *Hawthorne, Nathaniel, U.S. Consulate.
3rd May, 1849. *Hay, John, 2, Cable Street, and Parkfield Cottage, Birkenhead, Cheshire.
27th Sep., 1854. *Healy, Samuel R., 48, Castle Street, and Westbank House, Walton.
23rd Nov., 1848. *Heath, Edward, Orange Court, Castle Street, and St. Domingo Grove, Everton.
24th Oct, 1854. Heginbottom, George, Albert Terrace, Ashton-under-Lyne.
11th May, 1854. Henderson, Ebenezer, LL.D., Greenbank, St. Helens.
8th May, 1856. *Henderson, William, 41, Church Street.
8th June, 1854. *Herd, John, Brunswick street.
23rd Nov., 1848. *Herdman, William Gawin, West Villa, St. Domingo Vale, Everton.

23rd Nov., 1848. *Heywood, Sir Benjamin, Bart.*, F.R.S., F.S.S., Claremont, Manchester.
P. 23rd Nov., 1848. *Heywood, Thomas*, F.S.A., Hope End, Ledbury, Herefordshire.
H. Sher. Lanc. 1855-6. *Heywood, John P., Brunswick Street, and Norris Green, West Derby.
3rd April, 1856. Hibbert, Joseph, Brookbank, Hyde, Cheshire.
P. 4th Jan., 1849. Hibbert, Thomas Dorning, Middle Temple, London.
P. 23rd Nov., 1848. *Higgin, Edward, 6, Sweeting street & Blomfield House, Westbourne Terrace North, Paddington, London.
6th Dec., 1849. *Higgin, Thomas, Tower Chambers.
12th Sep., 1854. Higgins, Rev. H. H., M.A., F.C.P.S., Asylum, Rainhill.
P. 23rd Nov. 1848. Hill, Rev. John Wilbraham, M.A., Waverton, Cheshire.
26th April, 1855. Hinde, Rev. Edmund, M.A., Carrington, Cheshire.
P. 8th Dec., 1851. Hinde, John Hodgson, 9, Saville Row, Newcastle-on-Tyne, and Acton House, Felton, Northumberland.
11th May, 1854. *Hindley, Edward, 34, Exchange Street East.
18th Sept., 1854. *Hindley, Rev. Hugh Johnson, S.C.L., St. George's, Everton.
23rd Sept., 1854. *Hindmarsh, Fred.*, F.G.S., F.R.G.S., Bucklersbury, London.
16th Sept., 1854. *Hodson, Thomas L., 39, Islington.
Mayor Li. 1852-3. *Holme, Samuel, Church Street, and Holmestead, Aigburth.
24th Sept., 1854. *Holt, William D., 23, Edge Hill.
26th Sept., 1854. *Hore, Edmund Joseph, 6, George's Dock Gates.
20th Sept., 1855. *Horner, Francis, 33, Everton Road.
23rd Nov., 1848. *Horsfall, Thomas Berry, M.P., Mill Bank, West Derby.
14th April, 1853. **Houghton, Richard*, Crosby.
P. 8th Nov., 1849. *Howson, Rev. John Saul, M.A., Principal of the Collegiate Institution.
Mayor La. 1849-50. Howitt, Thomas, Lancaster.
27th Sept., 1854. *Hubback, Joseph, 27, Lower Castle Street, & Aigburth
14th Sept., 1854. *Hughes, Joseph, 2, Upper Duke Street, and 9, Brownlow Hill.
16th Sept., 1854. *Hughes, J. B., 59, Mill Street.
6th April, 1854. Hughes, Thomas, 4, Paradise Row, Chester.
8th Feb., 1852. Hulton, William Adams, Hurst Grange, Preston.
Mayor C, 1851-2. Humberston, Philip Stapleton, Chester.
P. 23rd Nov, 1848. *Hume, Rev. Abraham, D.C.L., LL.D., F.S.A., Corr. Mem. S.A. Scot., 24, Clarence street, Everton, Hon. Secretary.
9th Feb., 1854. *Hunt, Alfred W., B.A., 31, Oxford street.
9th Dec., 1852. *Hutchison, Robert, Tower Buildings, and Canning street.

I

9th Oct., 1854. Ingham, Rev. Thomas Barker, M.A., Rainhill.

J

1st April, 1852. *Jacob, John Gibborn, 56, Church street.
23rd Nov., 1848. Jacson, Charles R., Barton Lodge, Preston.

23rd Nov., 1848. James, Rev. David, M.A., F.S.A., Ph.D., Marsden, Huddersfield.
23rd Nov., 1854. *Jeffery, William R., 8, Montpelier Terrace, Upper Parliament street.
18th Sept., 1854. *Johnson, Henry, Walton.
23rd Nov., 1848. *Johnson, John H., 7, Church street.
3rd April, 1856. *Jones, Venerable John, M.A., Archdeacon of Liverpool, Waterloo.
23rd Nov., 1848. *Jones, Alfred, 17, Goree Piazzas.
23rd Sept., 1854. *Jones, Edward, 3, Grinfield Terrace, Edge Hill.
3rd May, 1849. *Jones, Morris Charles, 75, Shaw street.
6th Dec., 1849. *Jones, Roger Lyon, 1, Great George Square.
15th Sept., 1854. Jones, Thomas, B.A., Chetham Library, Manchester.

K

23rd Nov., 1848. *Kendal, Thomas, 9, Gambier Terrace.
P. 3rd May, 1849. Kendrick, James, M.D., Warrington.
1st Feb, 1840. *Kilpin, Thomas Johnson, 1, Arrad street, Hope street.

L

15th Dec., 1853. *Lace, William Henry, 1, Union Court, Castle street, and Beaconsfield, Woolton.
P. 23rd Nov., 1848. *Lamb, David, Plumpton Terrace, 29, Everton Road.
14th Mar., 1852. *Lambert, David Howe, 10, Exchange Chambers, Tithebarn street, and Bedford street.
LANCASHIRE, THE HIGH SHERIFF OF, VICE-PRESIDENT, *ex-officio*. (Robert Needham Phillips, Esq., the Park, Manchester.)
23rd Nov., 1848. Langton, William, Manchester.
21st Sept., 1854. *Lea, James, Surveyor, Egremont, Cheshire.
6th Dec., 1849. *Ledger, Reuben, Knotty Ash.
1st April, 1852. Lee, Rev. Thomas Falkner, M.A., Grammar School, Lancaster.
23rd Nov., 1848. Legh, G. Cornwall, M.P., High Legh, Warrington.
25th Sept., 1855. *Lidderdale, William, 42, Canning street.
4th April, 1850. *Lilford, the Lord, Oundle, Northamptonshire, and Grosvenor Place, London.
23rd Nov., 1848. *Lingard, Alexander Rowsand, Eastham.
23rd Nov., 1848. *Lister, James, Union Bank.
Mayor Li, 1851-2. *Littledale, Thomas, Highfield House, and 13, Exchange Buildings.
*LIVERPOOL, THE MAYOR OF, VICE-PRESIDENT, *ex officio*. (John Stewart, Esq., Leigh Street, and Mount Pleasant.)
19th Sept., 1854. *Livingstone, Henry D., B.A., at Gibbs, Bright & Co.'s, North John street.
14th Dec., 1848. *Lloyd, John Buck, Exchange Alley, Exchange street West, and Aigburth.
6th Jan., 1853. *Longton, John, Breck Road, and Peter's Place, Rumford street.
P. 23rd Nov., 1848. **Lord, Lieut. William*, R.N., 16, Sandon street.

23rd Nov., 1848. *Lowndes, Matthew Dobson, 7, Brunswick street, and Edge Lane.
14th April, 1853. Lyon, Thomas Henry, Appleton Hall, Warrington.
6th Dec., 1849. Lyon, Thomas, Appleton Hall, Warrington.

M

21st Sep., 1854. *MacIlveen, Alexander, Principal of the Liverpool Institute, Sandon Terrace.
3rd March, 1853. *Macintyre, Peter, M.D., 128, Duke street.
6th Dec., 1855. *Macfie, David Johnson, 1, Bachelor street.
27th Sep., 1854. *Macfie, R. A., 72, Upper Parliament street.
16th Sep., 1854. Mackreth, Rev. Thomas, B.D., Halton Rectory, Lancaster.
5th May, 1853. *_Macrae, John Wrigley_, Edge Lane, and 22, Hackin's Hey.
23rd Nov., 1848. *Macrorie, David, M.D., 126, Duke street.
3rd Jan., 1849. _Manchester, the Lord Bishop of_, Sedgley Hall, Manchester.
23rd Nov., 1848. Markland, James Heywood, D.C.L., F.R.S., F.S.A., Bath.
23rd Nov., 1848. *Marsden, George, Vernon Priory, Edge Hill.
P. 5th June, 1851. Marsh, John Fitchett, Fairfield House, Warrington.
9th Mar., 1854. *Mason, William Ithell, 14, Lower Hope Place.
23rd Nov., 1848. *Mather, Daniel, 58, Mount Pleasant.
23rd Nov., 1848. *Mather, John, 58, Mount Pleasant.
P. 23rd Nov., 1848. *Mayer, Joseph, F.S.A., M.R.Asiat.S., F.E.S., F.R.S. North. Antiq. Copenhagen, Hon. Mem. SS. Antiq., Normandy, l'Ouest, the Morini; de la Société d'Emulation, Abbeville, &c., 68, Lord street, Curator.
7th Feb., 1850. Mayer, Samuel, Newcastle-under-Lyne.
23rd Nov., 1848. *M'Quie, Peter Robinson, Low Hill, and 20, Water street.
6th Dec., 1849. *M'Viccar, Duncan, Abercromby Terrace, and 7, Exchange Buildings.
24th May, 1855. Melling, Thomas, C.E., Rainhill.
P. 6th Dec., 1849. *Middleton, James, F.S.A., Grecian Terrace, Everton.
P. 31st Dec., 1854. *Milner, William, 2, Downshire Terrace, Upper Parliament street, and 6, Lord street.
Mayor Li , 1848-9. *Moore, John Bramley, M.P., Hon. Mem. Archæological Association, Carioca Lodge, Aigburth, and Orange Court, Castle street.
23rd Nov., 1848. *Moore, Thomas, 32, Chapel Walks, and 10, Beaufort Terrace, Seacombe, Cheshire.
P. 8th Nov., 1849. *Moore, Rev. Thomas, M.A., 25, Newbie Terrace, Everton, Librarian.
P. 23rd Nov., 1848. Mortimer, William Williams, City Walls, Chester.
P. 23rd Nov., 1848. *Moss, Rev. John James, M.A., Upton, Cheshire.
7th Mar., 1850. *Mott, Albert J., 21, South Castle street, and Orchard Hey, Preston Road, Walton.
18th Sep., 1854. *Mott, Charles Grey, 7, Argyle street, Birkenhead, and 2, Parliament Terrace, Upper Parliament street.
19th Sep., 1854. *Musker, Roger Melling, Walton.

N

23rd Nov., 1848. *Neill, Hugh, F.R.A.S., 115, Mount Pleasant.
6th Dec., 1855. *Newton, John, 15, West Derby street.
23rd Nov., 1848. Nicholson, James, F.S.A., Thelwall Hall, Warrington.
25th Sep., 1854. *Nisbett, William, Church street, Egremont.
6th Dec., 1849. *North, Alfred, 33, Huskisson street.
29th Sep., 1854. *Nottingham, John, M.D., 18, Roscommon street.
13th Dec., 1854. Nuttall, Thomas, F.L.S., Nut Grove, Rainhill.

O

2nd Jan., 1851. *Oates, Capt. W. C.*, Cavendish Place, Bath.
P. 6th Dec., 1849. Ormerod, George, D.C.L., F.R.S., F.S.A., F.G.S., Sedbury Park, Chepstow.
6th Feb., 1851. Osborne, John James, Macclesfield.
3rd Jan., 1850. *Overend, James, 45, Hope street.

P

23rd Nov., 1848. *Paris, Thomas Jeremiah, 68, Lord street.
3rd Jan., 1850. *Parker, Charles Stewart, Bank Chambers, Cook street.
1st May, 1856. Parr, Rev. H., Vicarage, Taunton.
7th Mar., 1850. *Patten, John Wilson*, M.P., Bank Hall, Warrington.
2nd Nov., 1854. Patterson, Andrew, Principal of the Deaf and Dumb Institution, Manchester.
9th Oct., 1854. *Peacock, John, 2, Chapel street.
23rd Nov., 1848. Pedder, Edward, Ashton Park, Preston.
23rd Nov., 1848. Pedder, Richard, Stanley Terrace, Preston.
8th Dec., 1851. Perrin, Joseph, The Crescent, Levenshulme, Manchester.
P. 6th Jan., 1849. *Picton, James Allanson, F.S.A., 19, Clayton square, and Sandy Knowe, Wavertree.
10th Sept., 1854. *Picton, John, 65, Hunter street.
6th Dec., 1849. *Pierce, George Massey, 4, Exchange Alley, and Linacre Marsh.
3rd May, 1849. Pierpoint, Benjamin, Warrington.
23rd Nov., 1848. Pilkington, James, M.P., Park Place, Blackburn.
10th Feb., 1853. *Platt, Robert*, Dean Water, Handforth, Manchester.
23rd Nov., 1848. *Poggi, Rev. Dominica Joseph, D.D., New Brighton College, Cheshire.
6th Dec., 1849. *Poole, John, 23, Oxford street.
29th Dec., 1854. Porter, Rev. Jas., M.A., St. Peter's College, Cambridge.
Mayor M., 1849-52. Potter, Sir John, Kt., Manchester.
1st Sept., 1854. Preston, Rev. G., M.A., Grammar School, Whalley.
6th Dec., 1849. *Preston, William, 13, Vernon street, and Rock House, West Derby Road.

R

9th Mar., 1854. *Radcliffe, John, Eaton Cottage, Knotty Ash, and 4, Water street.
23rd Nov., 1848. Raines, Rev. Canon, M.A., F.S.A., Milnrow Parsonage, Rochdale.

P. 18th Sept., 1854. *Ramsay, Rev. Arthur, M.A., Hayman's Green, West Derby.
23rd Sept., 1854. *Rathbone, William, 24, Water street, and Greenbank, Wavertree.
21st Sept., 1854. *Rawlins, Chas. Ed., jun. 23, Temple Street, and 4, Windermere Terrace, Prince's Park
15th Mar., 1849. Rawlinson, Robert, C.E., F.G.S, 34, Parliament street, Westminster.
13th Sept., 1854. *Raynes, James Trevelyan, 37, Old Hall street, and Rock Park, Rock Ferry.
23rd Nov., 1848. *Reay, James, Guardian Office, Commerce Court, Lord street.
23rd Nov., 1848. *Reay, Thomas, 87, Church street.
29th Dec., 1854. *Rees, William, 28, West Derby street.
7th Mar., 1850. *Richardson, Samuel, 102, Pembroke Place.
1st Feb., 1855. *Rimmer, Henry Geo., 28, Breckfield Road south.
15th Nov., 1855. Roberts, Thomas, Kyffin, St. Asaph.
P. 23rd Nov., 1848. Roberts, William John, Cross Mount, Aughton.
14th Dec., 1848. *Robin, John, Chapel Walks, South Castle Street, and Grove Hill, West Kirby, Cheshire.
20th Dec., 1855. Robin, Rev. P. R., M.A., Barnston, Birkenhead.
23rd Nov., 1848. *Robinson, Charles Backhouse, 12, Myrtle Street, and Matilda Grove, Aigburth.
8th Mar., 1853. Robinson, John, Westfield, Huddersfield.
P. 3rd May, 1849. Robson, John, M.D., Warrington.
3rd Jan., 1850. *Ronald, Robert Wilson, Dale street.
14th April, 1853. *Ryder, Thomas Bromfield, 2, Elliott Street, Clayton Square.
25th Sept., 1854. Rylands, Peter, Warrington.
P. 13th Dec., 1854. Rylands, Thomas Glazebrook, Warrington.

S

6th Dec., 1855. *Sandbach, W. R., Bank Buildings, Cook street, and The Cottage, Aigburth.
P. 19th Sept., 1854. Sansom, Rev. John, B.A., Buslingthorpe Rectory, near Wragby, Lincolnshire.
P. 7th Sept., 1851. *Sansom, Thomas, A.L.S., F.B.S.E., Local Secretary of the Botan. Soc., London, 33, Everton Road.
23rd Nov., 1848. *Scholefield, Henry D., M.D., 14, Hamilton square, Birkenhead.
8th Jan , 1852. Sharp, John, The Hermitage, Lancaster.
2nd June, 1853. *Sharp, William*, 102, Piccadilly, London.
23rd Nov., 1848. Sharpe, Edmund, M.A., Coedfa, Llanwrst, N. Wales.
25th Sept., 1854. *Shaw, James, 4, Queen square.
1st Dec., 1855. *Shawe, J. R., Arrowe Hall, Cheshire.
7th Feb., 1850. *Sherlock, Cornelius, 22, King street.
Mayor La., 1851-2. Sherson, John Herdman, Lancaster.
3rd May, 1849. Shute, Robert, Crediton, Devon.
23rd Nov., 1848. *Simpson, Rev. Samuel, M.A.*, Douglas, Isle of Man.
23rd Nov. 1848. Skaife, Thomas, Vanburgh House, Blackheath, London.
21st Sept., 1854. Skelton, William, Bruch Hall, Warrington.

2nd May, 1850. ***Smith, James**, Brunswick Dock, and Seaforth.
30th Dec., 1854. *Smith, John Peter George, Borough Bank, Water street, and Spring Bank, Breck Road.
16th Sept., 1854. Smith, John, Macclesfield.
6th Jan., 1853 *Smith, William Penn, 26, Hanover street
23rd Nov., 1848. *Snowball, J. G., 16, Castle street, and 11, Upper Canning street.
2nd Nov., 1854. Stainer, William, Erskine street, Hulme, Manchester.
3rd Jan., 1856. Staniforth, Rev. Thomas, Storrs, Windermere.
13th Dec., 1855. *Steiner, F.*, Hyndburn, Accrington.
30th Dec., 1854. *Stewart, James Gordon, 8, West Derby street.
23rd Nov., 1848. *Stewart, Rev. John, M.A., Sandown Park, West Derby.
23rd Nov., 1848. Stewart, Rev. William, M.A., The Parsonage, Hale.
6th June, 1850. *Stock, John, 7, Exchange Buildings, and Westdale, Wavertree.
P. 23rd Nov., 1848. *Stonehouse, James, 9, Christian street North, Everton.
8th Nov., 1849. *Stuart, William, 1, Rumford Place, and Springfield House, Knotty Ash.
5th June, 1851 Stubbs, Joseph, Park Place, Frodsham.
25th Sep., 1854. *Sumners, Henry, Colquitt street.
21st Sept., 1854. *Surr, John, Everton Valley.
23rd Nov., 1848. *Sutton, Hugh Gaskell, Exchange Court, Exchange Street East, and Woodend, Aigburth.
4th Mar., 1852. *Sykes, James, Colonial Buildings, 34, Dale street, and Breck House, Poulton-le-fylde.
23rd Nov., 1848. Sweetlove, John, M.R.S.L., 41, Edward square, Kensington, London.

T

P. 23rd Nov., 1848. *Thom, Rev. David, D.D., Ph.D., 28, Erskine street, Vice-President.
P. 8th Dec., 1851. Thornber, Rev. William, B A., Blackpool.
13th Sept., 1854. *Thornely, Samuel, 22, Clarence street.
8th Dec., 1851. *Tinne, John A., F.R.G.S., 13, Bank Chambers, Cook street, and Briarley, Aigburth.
Mayor Li. 1854-55. *Tobin, James Aspinall, South John street.
14th Dec., 1848. Tobin, Sir Thomas, F.S.A., Ballincollig, Cork.
22nd Sep., 1854. Topham, Thomas, Castle street, Chester.
8th Jan., 1852. *Torr, John, 15, Exchange Buildings, and Eastham.
5th Dec., 1850. *Tucker, Robert, 11, North View, Edge Hill.
P. 23rd Nov., 1848. *Tudor, Richard A., M.R.C.S., Church View, Bootle.
14th April, 1853. *Turner, Charles, 4, Lancelot's Hey, and Dingle Head.
27th Sep., 1854. *Turner, John Hayward, 52, Rodney street.
6th Dec., 1849. Turner, Edward, High street, Newcastle, Staffordshire.
20th Dec., 1855. *Turner, William, Jun., Stourton, Cheshire.

U

8th Mar., 1854. *Underwood, Rev. Charles W., M.A., Vice-Principal Collegiate Institution.

V

23rd Nov., 1848. **Varty, Thomas*, Walpole Villa, Fairfield, and Lime street.
14th April, 1853. *Vose, James, M.D., 5, Gambier Terrace, Hope street.

W

Myr. C. 1838-39, 48-49. *Walker, Sir Edward Samuel*, Berry Hill, Mansfield, Notts.
6th Mar., 1851. Warburton, Rowland Eyles Egerton, Arley Hall, Cheshire.
17th May, 1855. *Warburton, Thomas, 122, Falkner street.
6th June, 1850. *Waterhouse, Sebastian, 13, Percy street.
26th Sept., 1854. *Watling, J. W. H., Wavertree.
2nd May, 1850. *Way, Albert*, M.A., F.S.A., Wonham Manor, Reigate, Surrey.
1st Feb., 1849. *Webster, George, 6, York Buildings, Sweeting street, and 7, Northumberland Terrace, Everton.
3rd Jan., 1856. Welton, Thos. A., F.S.S., 147, Fenchurch street, London.
1st Feb., 1849. **Whitehead, James Wright*, Orange Court, Castle street, and 15, Duke street, Edge Hill.
2nd June, 1853. *Whitley, George, 5, Clayton square, and Spital.
9th Oct., 1854. Whitley, Rev. John, M.A., Newton Rectory, Warrington
6th June, 1850. Whitley, Rev. William, B.A., Catsclough, Winsford, Cheshire.
P. 30th Nov. 1854. Wilkinson, Thomas Turner, F.R.A.S., Corr. Mem. Lit. and Phil. Soc. Manch., Burnley.
14th Sept., 1854. *Willink, Rev. Arthur, M.A., St. Paul's, Tranmere.
8th Jan., 1852. *Willoughby, Edward G., Marine Cottage, Tranmere.
6th Dec., 1855. Wilson, G. F., F.R.S., Belmont, Vauxhall, London.
23rd Nov, 1848. *Winstanley, Samuel T., Church street.
23rd Nov., 1848. Wood, Venerable Isaac, M.A., Archdeacon of Chester, The Vicarage, Middlewich.
23rd Nov., 1848. Wood, Isaac Moreton, M.A., Middlewich.
9th Feb., 1854. Wood, Samuel, F.S.A., The Abbey, Shrewsbury.
10th Feb., 1853. *Wood, Thomas, B.A., Blue Coat Hospital.
7th May, 1851. **Woodhouse, John George*, 47, Henry street.
3rd Oct., 1854. Woolnough, Rev. Edward, Northenden Rectory, Stockport.
30th Dec., 1854. Worthy, George Smith, Bristol.
5th May, 1853. *Wylie, Alexander Henry, Union Court, Castle street.

HONORARY MEMBERS.

6th Feb., 1851. Akerman, John Yonge, Sec. S.A.; Hon. M.R.S.L.; F.S.A. Newcastle; F.R.S. of Northern Antiquaries; Corr. Mem. SS. Antiq. Scot. France, Russia, Switzerland, Rome; Hon. Mem. Roy. Acad., Stockholm; Somerset House, London.
27th Sept., 1854. Babington, Charles Cardale, M.A., F.R.S., St. John's College, Cambridge.

P. 13th Nov., 1851.	Bell, William, Ph.D., 15, Woburn Buildings, Euston square, London.
6th Feb., 1851.	Blaauw, William Henry, M A., F.S.A., 3, Queen Anne street, London, and Beechland, Uckfield, Sussex.
6th Feb., 1851.	Boileau, Sir John P., Bart., F.R.S., F.S.A., Kettering-ham Hall, Wyndham, Norfolk, and 20, Upper Brook street, Grosvenor Square, London.
27th Sept., 1854.	Brewster, Sir David, K.H., D.C.L., LL.D., F.R.SS.L. & E., Hon. M.R.I.A., St. Andrews, N.B., and Allerby, Roxburghshire.
6th Feb., 1851.	Charlton, Edward, M.D., F.S.A. Newc., 7, Eldon square, Newcastle-on-Tyne.
P. 1st Feb., 1855.	Clarke, Joseph, F.S.A., Saffron Walden, Essex.
8th Jan., 1852.	De Perthes, J. Boucher, de Crevecoeur, Chevalier des ordres de Malte et de Legion d'honneur, membre des diverses Sociétés Savantes, Abbeville.
6th Feb., 1851.	Duncan, Philip B., D.C.L., Oxford.
27th Sept., 1854.	Gray, John Edward, Ph.D., F.R.S., F.Z.S., F.R.G.S., President of the Botan. Soc,. British Museum, London.
27th Sept., 1854.	Latham, R. Gordon, M.D., F.R.S., 22, Upper Southwick street, London.
6th Dec., 1849.	Londesborough, The Lord, K.C.H., F.R.S., F.S.A., President of the Numismatic Society, Grimston, Tadcaster, and 8, Carleton House, Terrace, London.
9th Dec., 1852.	MacAdam, Robert, 18, College square, Belfast.
27th Sept., 1854.	Murchison, Sir Roderick Impey, G.C.St.S., M.A., D.C.L., F.R.S., V.P.L.S., F.G.S., V.P. R. Geogr. S., Hon. M.R.I.A., Director-General of the Geological Survey of Great Britain and Ireland; Trust. Brit. Mus.; Hon. Mem. Acadd. St. Petersburgh, Berlin, Copenhagen; Corr. Mem. Inst. France, &c., 16, Belgrave square, London.
27th Sept., 1854.	Owen, Richard, M.D., LL.D., F.R S., F.L S., F.G.S., Royal College of Surgeons, London.
P. 7th May, 1851.	Pidgeon, Henry Clarke, 3, Westbourne Villas, Harrow Road, London. [London Secretary.]
27th Sept., 1854.	Phillips, John, M.A., F.R.S., F.G.S., Magdalen Bridge, Oxford.
27th Sept., 1854.	Rosse, the Earl of, K.P., D.C.L., F.R.S., F.S.A., F.R.A.S., F.G.S., Birr Castle, Parsonstown, Ireland.
27th Sept., 1854.	Sabine, Colonel Edward, R.A., D.C.L., Treas. and V.P. R.S., F.R.A.S., 13, Ashley Place, Victoria Street, London, and Woolwich.
27th Sept., 1854.	Sedgwick, Rev. Adam, M.A., F.R.S., F.G.S., F.R.A.S., Hon. M.R I.A., Woodwardine Lecturer, Trinity College, Cambridge.
6th Feb., 1851.	Smith, Charles Roach, F.S.A., Hon. Mem. SS. Antiq. France, Copenhagen, Normandy, Scotland, Spain, Newcastle, the Morini, Abbeville, Picardy, Wiesbaden, Luxemburg, Treves, Touraine, &c., Temple Place, Strood, Kent.
6th Feb., 1851.	Turnbull, William B.D.D., F.S.A., Scot., 3, Stone Buildings, Lincoln's Inn, London.

6th Feb., 1851 Turner, Dawson, F.R.S., F.S.A., F.L.S., Hon. M.R.I.A., M.R.S.L., Acadd. Caes. Nat. Cur. et Reg. Sc. Holm. Socius, Lee Cottage, Old Brompton, and Athenæum Club, London.

27th Sept., 1854. Whewell, Rev. William, D.D., F.R.S., F.G.S., F.R.A.S., Hon. M.R.I.A., Master of Trinity College, Cambridge.

6th Feb., 1851. Williams, Rev. John, M.A., Llanymowddwy, Dinas Mowddwy.

6th Feb., 1851. Willis, Rev. Robert, M.A., F.R.S., Jacksonian Professor, Caius' College, Cambridge.

P. 27th Sept., 1854. Wright, Thomas, M.A., F.S.A., Hon. M.R.S.L., Member of the Institute of France; Corresp. Mem. Soc. Antiq. Normandy; of the Roy. Soc. Northern Antiqs. Copenhagen; of Soc. Antiqs. Scotland; and of Comms appointed by French Gov. for publication of Histor Mon., &c.; 14, Sydney street, Brompton, London.

EXTRACTS FROM THE LAWS.

Resident * Members shall pay to the Society One Guinea annually, due in advance, on the 18th of October. Non-resident Members shall pay, in like manner, Half a Guinea. vi.

Any Member whose payments are not in arrear, may become a Life-Member, by paying ten annual subscriptions in one sum. vii.

Any Member whose payments are not in arrear, may withdraw from the Society, on conveying to the Secretary a written intimation to that effect. * * * xi.

Members may be ejected from the Society, for—(1) neglecting to pay their subscriptions† for three consecutive years; or, (2) contemptuous and repeated violation of the Laws. * * * xii.

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* Those having addresses in Liverpool, or residing within seven miles of the Town Hall.

† "The Literary and Scientific Institutions Act, 1854," provides for the recovery of Subscriptions to any Institution, "established for the promotion of Literature, Science, or the Fine Arts, or for the Diffusion of Useful Knowledge," by a suit in a Civil Court.

ERRATUM.

Page 221, line 15, for "See p. ii," read "See p. vi."

TRANSACTIONS.

ON THE STATE OF THE WESTERN PORTION OF THE ANCIENT KINGDOM OF NORTHUMBERLAND, DOWN TO THE PERIOD OF THE NORMAN CONQUEST.

By John Hodgson Hinde, Esq.

(Read on the 3rd and 17th of January, 1856.)

The kingdom of Northumberland, in its integrity, comprised the entire district which lies between the Mersey and the Humber to the South, and the Friths of Clyde and Forth to the North. The Northern limits have never been disputed, and, although Dr. Whitaker has suggested that the Ribble, rather than the Mersey, formed its South-western boundary, we have on the other side the unquestionable testimony of the Saxon Chronicle, that Manchester, seated on the latter river, was subject to the Northumbrian kings, not only during the early preponderance of that state, but almost to the close of its existence, a century after the other members of the Heptarchy were absorbed in the monarchy of Egbert. "In the year 923," we read that "King Edward commanded a body of Mercians to take possession of Manchester, *in Northumberland*, and to repair and occupy it." To the South-east, the Humber furnished both a limit and a name to this extensive territory.

If history had been altogether silent, the nomenclature of the district would of itself afford sufficient evidence that a people speaking a language radically different from the Saxon, were its earliest colonists. It is true, that in the names of the towns and villages, we generally find indications of an Anglo-Saxon etymology, and such we should expect to be the case from our experience in all parallel instances. Wherever a new people settle, they invariably give, to their acquired abodes, names which are significant in their own language; and the more complete the extermination or subjection of their predecessors, the more universal the change of topographical

designation. It extends, indeed, not merely to the hamlets which they occupy, but to the fields which they till, and to the hill-sides where their flocks are depastured. If we go beyond this, and inquire amongst the rugged mountains, the crags, the caverns, and, above all, the rivers, we invariably meet with traces of the earlier inhabitants. Throughout the ancient limits of Northumbria, whilst the towns and villages remind us of the Anglo-Saxon settlement, or the more recent domination of the Danes, the rivers and bolder features of the country reveal, in their names, the antient haunts of a Celtic people. If, in other districts of Britain, the traces of this primæval race are faint or uncertain (which, however, I must not be understood to affirm), the case is far otherwise here. In the rivers especially, whether they fall into the Western or Eastern sea, in the Clyde, the Eden, and the Lune, equally with the Tweed, the Tyne, and the Ouse, we have indisputable remains of a Celtic language.

Whatever mixture of race took place previous to Cæsar's invasion, between the Britons and their continental neighbours, was confined, as far as our information extends, to the southern coast of the island—if, indeed, even here the intruders were not descended from the same stock as those amongst whom they established themselves. That the original inhabitants of Gaul were of the same lineage as the Britons has never been questioned; but the more recent settlers in this island were derived from the Belgic, as distinguished from the Celtic portion of that country, and Cæsar tells us, on the authority of the best informed of the Belgian people, that the latter were the descendants of a band of adventurers who had emigrated in comparatively recent times from the German banks of the Rhine. There is no reason to doubt the strict accuracy of this account; nor is it to be wondered that Cæsar, who was no critical ethnologist, accepted this fact as a proof of identity of race between the Belgians and the Germans. We know, however, that the tribes who were familiar to Cæsar as Germans, and whom we still recognize as such, were not the original inhabitants of Germany, but that that vast territory, extending to the sources of the Danube, was possessed in the time of Herodotus by the same Celtic race who occupied Gaul and all Western Europe, to the confines of the *Cynetæ*. Even in Cæsar's time the Germans were but recent colonists in their adopted country, and it is more probable that the Belgæ were the last remnants of the original Celtic population of Germany, and were driven across the Rhine by the invading Germans, than that they

were themselves a portion of the invading host. It is sufficiently wonderful that a district so wide as Germany should have been occupied in a comparatively short period by a people previously unknown to the civilized world, without assigning to them a third of Gaul also, separated as it is from their actual conquests by so formidable a natural barrier as the Rhine. Even, however, admitting the German origin of the Belgæ, and their amalgamation with the maritime tribes of Southern Britain, still, in the district immediately under consideration, the Celtic blood remained unaffected by foreign alliances, when the expedition of Cæsar directed attention to an island previously almost unknown to geographers beyond its name.

After the establishment of the Roman supremacy, there can be no doubt that the exclusively Celtic character of the population was considerably modified; first by the settlement of Roman citizens either holding official appointments or engaged in commerce; secondly, and to a much greater extent, from the legionary and auxiliary forces quartered in the island. If the auxiliary troops had been solely or chiefly derived from one province of the empire, there is no question that their long residence amongst a subject people must have had a tendency to introduce their own customs, arts, and, to a certain extent, their language, amongst the general population; but so far was this from being the case, that amongst the garrisons scattered over the island we find representatives of almost every nation which owed allegiance to Rome, and the influence of each corps must either have been purely local, or, which is more probable, the whole must have merged their provincial peculiarities in their acquired characteristics as Roman soldiers. In this way, the tendency of this vast military establishment was to effect the complete Romanization of the British people. An idea has indeed been put forth by some writers that an element of Saxon, or at least of German, nationality was predominant amongst the auxiliary forces; but this has been advanced without due consideration of the authentic documentary information which we possess on this subject. In the Notitia we have a complete list of all the garrisons in Britain. Excluding the legionary troops, we find eight garrisons of auxiliaries under the command of the Count of the Saxon Shore, of which two only were Germans, a troop of Tungrecani at Dover, and a cohort of Vetasii at Reculver. Under the Duke of Britain we find thirty-six, of which not more than three were Germans, the first cohort of the Batavians, the first cohort of Tungri, and the first cohort of Frixagi, if, indeed, the last were Germans, but their

nationality is not clearly ascertained. Of the other garrisons under the Duke of Britain, thirteen were either not derived exclusively from any particular locality, or their country cannot be determined.* The remaining twenty are derived from no fewer than ten distinct provinces of the Roman Empire, and as the whole were quartered in the district now under consideration, it may be well to mention the number from each, viz.: six from Belgium,† and two from the other provinces of Gaul,‡ five from Spain,§ two from Dalmatia,‖ and one each from Pannonia,¶ Dacia,** Thrace,†† Mauritania,‡‡ and Sarmatia.§§ These garrisons were not mere moveable forces, subject at any time to be transferred from one station to another, but rather military colonies which occupied the same position for ages, as appears from numerous inscriptions commemorating the same troop or cohort, resident in the same locality during a long series of years. Whether each company was recruited from the colony of which it was the nucleus, or by drafts from the province to which it originally belonged, or by indiscriminate enlistment from any quarter, we are not in a condition to determine; neither do we know whether the officers, as well as the men, were provincials, or whether, like our own Indian Army, the officers belonged to the parent state, the men to the provinces, or if any general rule prevailed on this head; and yet all these are considerations which would materially affect the social position not only of the colony but of the district in which it was situated. It is not probable that any considerable portion of the auxiliary forces were withdrawn with the legionary from Britain, when the

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* Equites Catafractarii.
Numerus Vigilum.
Numerus Exploratorum.
Numerus Directorum.
Numerus Defensorum.
Numerus Supervenientum.
Cohors prima Ælia Classica.
Ala Prima Herculea.
Ala Saviniana.
Ala Petriana.
Numerus Pacensium.
Numerus Longovicarisium.
Cohors prima Cornoviorum.

† Numerus Nerviorum.
Cohors tertia Nerviorum.
Cohors sexta Nerviorum.
Cohors secunda Lingonum.
Cohors quarta Lingonum.
Cohors prima Morinorum.

‡ Cohors quarta Gallorum.
Numerus Solensium.

§ Cohors prima Hispanorum.
Numerus Barcariorum Tigrensium.
Ala prima Asturum.
Ala secunda Asturum.
Cohors prima Asturum.

‖ Equites Dalmatæ.
Cohors secunda Dalmatarum.

¶ Equites Crispiani.
** Cohors prima Ælia Dacorum.

†† Cohors secunda Thracum.

‡‡ Numerus Maurinorum.
§§ Cuneus Sarmatarum.

Romans relinquished the sovereignty of the island; many garrisons were no doubt overwhelmed and annihilated, especially on the frontier, by the northern barbarians, and many were probably merged in the general population, with whom they must, from long residence and frequent alliances, have become identified in interest and feelings.

All these considerations seem to point to the conclusion, that on the termination of the Roman power the original Celtic element was still predominant in the population, mixed indeed with many others by a variety of foreign connections, and improved and refined by contact with the Roman citizens. The presence of a Belgian corps in one locality, of a Spanish in another, and of a German in a third, would, to some extent, alter the provincial characteristics in each, but not to such an extent as materially to affect the national character of the Briton civilized by the Roman, or in the appropriate phrase, which has been generally adopted, the Romanized-Briton.

The Saxons are known to us by name as early as the time of Ptolemy, about A.D. 120, but they were then an obscure tribe, sharing, with seven others, the contracted territory of the Cimbric Chersonese; and more than a century and a half elapsed before they did anything to merit the notice of historians. In the year 287, we read of a confederacy of Saxons and Franks, who had made themselves so formidable by their incursions on the coasts of Belgium and Armorica, that a Roman fleet was stationed at Boulogne to check their piracies, and the celebrated Carausius, who afterwards assumed the purple in Britain, was appointed to the command. The shores of Britain were before long subjected to similar devastations, and an officer was appointed, with the title of Count of the Maritime Tract, whose special duty was to defend the Southern and Eastern coasts from the barbarians. In the year 367, the Count of the Maritime Tract was slain, together with his brother-officer, the Duke of Britain, in an incursion of the Picts and Scots. The Saxons do not, at that period, occur amongst the invaders of Britain, but they made a simultaneous movement against the shores of Gaul, which added to the perplexities of the Roman Emperor, Valentinian, and might even have been fatal to his power, but for the vigorous measures taken by his General, Theodosius.

The title given to the guardian of the sea-coast in the Notitia is "Count of the Saxon Shore," and the garrisons under his command extended from

Lyme in Dorsetshire, to the coast of Norfolk, between which points one legion and eight bodies of auxiliaries were stationed in strong positions.

Whilst the imperial government continued, and these garrisons were maintained, it is difficult to believe that any permanent Saxon settlements were effected within the limits specified, nor do historians record any further North, although the coast from the Tyne to the Forth seems to have been altogether unprotected.

The withdrawal of the Roman legions seems to have opened to the Saxons a new sphere of action. Their enterprises were no longer confined to mere predatory expeditions, but they carried out, on a small scale indeed at first, plans of permanent conquest. The first Saxon settlement on record was in the Isle of Thanet, and was subsequently extended to the whole of Kent. The second, and at no distant interval, was at the North-eastern extremity of what was afterwards the kingdom of Northumberland, adjacent, as we read in Nennius, to the great barrier, erected in the reign of Antoninus Pius, between the Forth and the Clyde. We may criticise the narrative of Nennius; we may question his details, and refuse to credit the alleged relationship between the two leaders, Octa and Ebissa, and the Kentish Hengist; but there is no reason to doubt the fact of a very early Saxon settlement in this district. No part of the coast held out greater temptations. The shortness of the voyage, the fertility of the land, the utter want of all means of defence, in a district which had already been drained of its population during the Pictish inroads, were recommendations which were not likely to be neglected, and the fact of a settlement having been effected in this quarter is indirectly confirmed, though not directly stated by Beda. * This early colonization of Lothian is not without interest, as affording materials for speculation on the historical realities of the reign of king Arthur, divested of the absurd legends with which they

* Having briefly noticed the settlement of Hengist and Horsa, in Kent, he proceeds to say, "In a short time, swarms of the aforesaid nations came over into the island, and increased so much, that they became terrible to the nations who had invited them. Then having on a sudden entered into alliance with the Picts, they turned their arms against their former confederates." These new invaders can hardly have been the bands of Aella, or Cerdic, the only leaders whose names occur in the Saxon Chronicle, as invaders of Britain, for many years after the arrival of Hengist. Hengist himself, as well as Aella and Cerdic, had sufficient occupation within the districts in which they severally settled, in the South of Britain, without involving themselves in an offensive alliance with an alien people, at the further extremity of the island. The Saxons who entered into this alliance, must have been neighbours of the Picts, and such were the colonists of Lothian, as described by Nennius.

have been blended. The names, at all events, of several of his battle-fields, exist in the locality, and the ancient name of Lothian itself does not materially differ from that of "the region Linnuis," in which the site of four of these battles is placed by Nennius and Henry of Huntingdon.*

In tracing the establishment of the kingdom of Northumberland, however, we have a void of a century before we reach the times of Ida, from whom, as Beda and the Saxon Chronicle inform us, the Royal race of Northumberland sprung. From this intimation, we are apt to conceive rather exaggerated notions of the magnitude of Ida's kingdom, which was not that of Northumberland, but Bernicia only, one of the petty States out of which that kingdom was afterwards formed. Bernicia itself, in after times, was a province of very considerable magnitude, extending from the Tees to the Frith of Forth, but it would be rash to affirm that the kingdom of Ida enjoyed such ample limits. We know not, indeed, whether Lothian formed any part of it; all that is recorded on this head being the situation of its capital at Bamburgh, within the present county of Northumberland. The reign of Ida lasted twelve years, from A. D. 547 to 560; the reigns of six of his successors occupied thirty-three years. Contemporary with the latter, for thirty years, was Ælla, king of Deira, the district between the Humber and the Tees. In 593, Ethelfrith, the grandson of Ida, succeeded to the throne of Bernicia, to which he added that of Deira also, by the expulsion of Edwine, the son of Ælla, and so established the kingdom of Northumberland. The coast from the Humber to the Forth had been gradually filled with a Saxon population, the original inhabitants having been exterminated, or driven into the interior, after a desperate but ineffectual resistance. Of this struggle we gather a few details from the Saxon genealogies, appended to Nennuis; and several of the lays, yet extant, of the British Bards of the sixth century, are devoted to the praise of the native chieftains, who for a while withstood the onslaught of Ida and his successors. To Ethelfrith was reserved the conquest of the central and Western portion of Northumbria, and we find in the pages of Beda ample testimony to the completeness of his success. "He conquered," as

* "The second, third, fourth. and fifth battles, were on a river called Dubglas, in the region Linnuis." Giraldus Cambrensis applies the name Leonis to Lothian, and in an ancient record, of the reign of Henry II., we find the same district described as Loeneis, a name which still more nearly approximates to Linnuis. Again, if Linnuis be Lothian, we have no difficulty in identifying the Dubglas with the little river Dunglas, which is in that district.

we read, "more territories from the Britons than any other king or tribune;" but though he was thus able to overrun a vast district of country, his followers were not sufficiently numerous to colonise it. In some places, indeed, "he expelled the inhabitants, and placed Angles in their stead," but "in others," and doubtless to a much greater extent, "he allowed the vanquished to retain their lands, on payment of tribute." Even in the succeeding reign of Edwine, the West Riding of Yorkshire retained its British population and form of government, and one of the incidents of which we read, is the expulsion of a petty prince, on the very outskirts of that district, Certic, king of Elmet. The only exploit of Ethelfrith within the Western limits of Northumberland, of which Beda gives any account, is the defeat of Aidan, king of the Scots, at Degsastan, or Dawston, in Liddisdale, but that he was master of the whole country Southwards, to the extreme boundary of Lancashire, may be inferred from the details which we possess of his successful invasion of the present county of Chester. The defeat of Brocmail, at Carlegion, and the slaughter of the monks of Bangor, are familiar to every reader; nor are we without grounds for believing that this victory was followed by the permanent subjugation of the country South of the Mersey, and that Ethelfrith may be regarded as the founder of the Mercian, as well as the Northumbrian kingdom. Crida is indeed described by some of our historians as the first king of Mercia, but he seems to have been the tributary, as he was the contemporary, of Ethelfrith, for his grandson Penda was, as we learn from the Saxon genealogies above referred to, the first of the Mercian rulers who established an independent monarchy, and threw off the yoke of the Northern kings.

Except as regards the absorption of the little kingdom of Elmet, the reign of Edwine does not appear to have been distinguished by any alteration in the internal condition of his dominions. The Anglo-Saxon population were under his immediate government; the petty British States were still ruled by tributary princes. His ambition was rather to extend his authority beyond the limits of his own kingdom, than to consolidate his power at home. In this larger object he was for a while preeminently successful; "he obtained the supremacy over all the nations, as well Angles as Britons, who inhabit Britain;" and he is even said to have subdued Man and Anglesea. The impolicy of his conduct was however apparent in the sequel. The submission of Caedualla, king of North Wales, was neither cordially tendered, nor easy to be enforced, whilst Penda, the tribu-

tary king of Mercia, bore with impatience his dependent position. The union of these two powerful neighbours, aided, in all probability, by the British States within his own territory, exposed him to an invasion on a scale so formidable, that he was unable to offer any adequate resistance, and, although he hastened to meet the enemy with such forces as he could muster, the event of the battle was not only fatal to himself, but destructive to the military power of his kingdom, his troops being all either slain, or hopelessly dispersed. The conflict took place at Hatfield, in the Southern part of Yorkshire. That Edwine should have moved thus hurriedly forward to meet the invaders on the frontier, rather than taken time to collect the strength of his kingdom in a more central position, was, perhaps, the result of distrust in the native population, who were at least as likely to join the kindred ranks of the invaders, as to aid a sovereign, to whom they were bound by no tie, but the yoke of conquest. At all events, if we are without direct information of their participation in the revolt, we know that they were not slow in availing themselves of its result. The kings of Strathclyde, the most important of the tributary States, of whom we hear nothing since the time of Ethelfrith, again appear on the page of history, having seized on this opportunity of asserting their independence. Of the British kingdoms which subsisted in Northumberland prior to the Saxon invasion, Birneich and Deur (Bernicia and Deira) were, as we have seen, overwhelmed by the followers of Ida, and of Ælla. Reged, to the West of Birneich, fell, after a vigorous resistance, under the repeated assaults of the Saxon chieftains, whose reigns intervened between those of Ida and Ethelfrith. Elmet again was colonised by Edwine, but to the West of these limits, Saxon occupation does not appear to have extended. Of the petty rulers, however, of the tributary provinces, no notices have been transmitted to us, except as regards the kings of Strathclyde, or, as they are designated by our earliest informants, of Alclyde, the latter being the name of their capital, on a rocky eminence, adjacent to the modern town of Dumbarton, whilst the former significantly describes the position of their territory in the great Strath or valley of the Clyde. Amongst the British kings, who warred against Hussa, king of Bernicia, the predecessor of Ethelfrith, besides Urien, of Reged, and Guallane, Nennius mentions Morcant and Riderch-hen, names we cannot fail to identify with Morken, and his successor, Ryderic, whom we meet with in Joceline's Life of Kentigern, as kings of Strathclyde, or, as he chooses to designate it, "the kingdom of

the Cambri." For our meagre knowledge of their successors, we are indebted almost exclusively to the brief notices of the Irish annalists.

On the death of Edwine, the antient divisions of Bernicia and Deira were again held for a short period as separate kingdoms, the former by Eanfrid, the son of Ethelfrith, the latter by Osric, the son of Ælfric, the brother of Ælla, and uncle of Edwine. It was not, however, to be expected that either state, weakened as each was by the late disaster, could successfully resist a power which had overthrown the sovereign who wielded the resources of both. Accordingly, we find Osric slain, with all his forces, in an attack upon the British king, and Eanfrid compelled to appeal to the mercy of the conqueror, and by him barbarously murdered. For the space of a year we have the unusual spectacle of a British monarch reigning over a great Saxon state, "not," says Beda, "like a victorious king, but like a rapacious tyrant, ravaging and destroying." This state of affairs was put an end to by Oswald, the brother of the murdered Eanfrid, who engaged and defeated the usurper in the neighbourhood of Hexham. Of Oswald we are told, "he brought under his dominion all the nations and provinces of Britain, which are divided into four languages, the Britons, the Picts, the Scots, and the English." This is, however, somewhat inconsistent with another statement of the same venerable historian, in which he claims for Oswald only the same extent of dominion which had been attained by Edwine, and ascribes to his brother Osric the subjection, and that only partially, of the Picts and Scots. It is not to be concealed, indeed, that Beda somewhat unduly magnifies the prowess and temporal grandeur of the patrons of his own church, whilst the heretic Britons meet with even less favour at his hands than his Pagan countrymen. However great the power of Oswald, he was defeated and slain by Penda, king of Mercia, who appeared as an auxiliary only in the former battle, which terminated in the death of Edwine. The reign of Osric extended from the year 642 to 684, during which period, whatever might be his success against the Picts and Scots, we have no record of any attempt to bring the British population of his own dominions under his more immediate control. This work seems to have been reserved for his son and successor, Ecgfrith, to whose reign may be ascribed, with tolerable certainty, the complete subjugation of the Britons of Lancashire, Cumberland, and Galloway, the entire remnant of the native population within his limits, with the single exception of Strathclyde. We have not, indeed, any account of the abolition of the

tributary domestic government either in Cumberland or Lancashire, but we have authentic records of the share of the spoil which Ecgfrith rendered to the Church. In Cumberland, he gave to Saint Cuthbert, Carlisle with the country for fifteen miles roundabout; in Lancashire he gave him Cartmel, "with all its Britons." Had these districts been in the immediate possession of the preceding Christian kings of Northumberland, it is not probable that until this reign the ecclesiastical historian would have been utterly silent as to any religious foundation, or donation to the church, between the Solway and the Mersey. Even now we have no evidence that the Northumbrian kings resided at all amongst their western subjects, as they did, sometimes at one place, sometimes at another, at different seasons of the year, amongst the Anglo-Saxon population of the east. Even in Beda's time, half a century later, amongst the numerous villas maintained for the migratory residence of the royal household, not one occurs beyond the chain of hills which separated the eastern district of the Northumbrian kingdom from the west. The reason is obvious, that even then no attempt had been made to colonise the latter. Of Galloway we only know that it was incorporated with the province of Bernicia in Beda's time; and when we look to the disorganized and abject state of Northumberland, as described by himself, for forty-six years previous, we can hardly ascribe its subjugation to a later period than the reign of Ecgfrith. After his disastrous death "the hopes and strength of the English crown began to waver and retrograde; for the Picts recovered their land, which had been held by the Angles, and the Scots that were in Britain, and some, also, of the Britons themselves, recovered their liberty, which they still retain after a period of forty-six years." These Britons who recovered their liberty were, undoubtedly, the people of Strathclyde. If Galloway had, like Strathclyde, maintained a domestic, though dependent, government at the critical period of Ecgfrith's death, we can hardly doubt that, like her northern neighbour, she would then have achieved her independence. That she did not do so, but continued a member of the province of Bernicia, we have already seen.

Of the civil government of Galloway during the century which succeeded the death of Beda, we have no particulars, but for more than half that period we may infer that no change took place, as during that time the series of Anglo-Saxon bishops was uninterrupted. The last of these was Baedulph, who was appointed A.D. 790, but how long he held the see is altogether uncertain; neither do any of our historians mention the cause of the

abolition of the episcopate. Little doubt, however, exists on this head, for we learn indirectly, from several sources, that not long after this time the government of the province must have passed out of the hands of the kings of Northumberland, and that this revolution was brought about by the invasion of a people, from whose residence, within its bounds, the district acquired the name of "Terra Pictorum," the land of the Picts. Chalmers, and other Scotch antiquarians, maintain that these intruders were not the well known Picts of North Britain, but a tribe who long resided in Ireland, under the designation of "Cruithne," of which they inform us "Pict" is a translation. Notwithstanding this respectable authority, it may be fairly questioned, whether an invasion by the Picts of the north is not at least as probable as by the "Cruithne" from the west; and whether it is not more likely that the term "Picts" was applied by the neighbouring people to a race who had long borne it, and who still existed under it at no remote distance, than that this familiar term was transferred as a translation of the barbarous name of new settlers from another island. In support of this view we may also refer to the events, in connection with which we first hear of the Picts of Galloway. In the year 837, we read in an antient document, printed by Innes, under the title of "Nomina Regum," that Alpin, king of the Scots, was slain by the Picts in a locality which is clearly recognised within this district. Again, we learn that his death was avenged by his son Kenneth, and "hence," says our authority, "the government of the Picts was superseded by the government of the Scots." Now the government which was superseded was not that of the Cruithne, but of the antient Picts, and we may surely infer that the people whose atrocity led to this retribution were Picts also, and not Cruithne. From the accession of Kenneth to the joint rule of the Picts and Scots, the term "Picts" ceased to be applied to any portion of the united people. So complete, indeed, is the disuse of the name, that it was long contended that the people themselves were exterminated by the avenging Scots. In Galloway, however, the name still subsisted. In 875 the Danes ravaged the territory of the Picts and Strathclyde Britons. Joceline, in his life of Kentigern, uses "Terra Pictorum," in speaking of Galloway; and Reginald of Coldingham, in describing the wanderings of the monks of Lindisfarne with the body of their patron, St. Cuthbert, places beyond dispute, the locality of the land of the Picts, by noticing Kirkcudbright as within its limits. As late as the middle of the twelfth century, Richard of Hexham,

a contemporary writer, speaking of the natives of Galloway, who formed part of the miscellaneous forces of the Scotch king at the battle of the Standard, describes them as Picts.

Of the government of these people, till they passed under the rule first of the kings of Cumberland, and afterwards of those of Scotland, we know nothing, but for ages after they were united to the latter monarchy, they preserved traces of laws and customs peculiar to themselves.

Two of the kings of Strathclyde, Morken and Ryderic, have already been noticed, as the opponents of the Saxon conquerors of Bernicia, in the sixth century. It may not be out of place to collect here such further particulars of this little State as are to be met with in the pages of the English and Irish annalists. The latter speak of them as kings of Alclyde, and sometimes as kings of the Britons, under which latter denomination it is not always easy to determine whether these princes, or the kindred rulers of North Wales, are the parties indicated. In the Saxon Chronicle, the term "Strathclyde Welch" is used. This is rendered "Cumbri" by Ethelward, whose annals are little more than an abridged translation of the chronicle. Joceline again, who wrote in the twelfth century, extending this nomenclature from the people to their country, talks of the latter as "Regnum Cambrense," "Regnum Cambrinum," and "Cambria," thus causing succeeding writers to confound the little district of Strathclyde with the larger territory of Cumbria, which as yet had no existence under any general government, or common name. Even Chalmers, although he emphatically cautions his readers against the mistakes of his predecessors in this very particular, does not avoid error himself, in respect to the limits either of the Regnum Cambrense of Joceline, or of the kingdom of Cumbria. In the former he includes Galloway, from the latter he excludes Cumberland, South of the Solway, and thus asserts the identity of the two. The limits of Cumbria will form a necessary subject of enquiry, by and by. As regards the Regnum Cambrense, or kingdom of Strathclyde, we have already seen that it enjoyed an independent existence, whilst Galloway was comprised within the Saxon province of Bernicia. Even Joceline himself, whose inaccurate nomenclature has led others into error, does not claim Galloway as within the Regnum Cambrense. On the contrary, when he speaks of the missionary labours of Kentigern, in "the land of the Picts" (the name by which Galloway was known in his time), he expressly tells us that it was

beyond the precincts of the diocese of the Saint, which was co-extensive with the Cambrian kingdom. Assigning to Galloway the utmost extent which has ever been claimed for it, there still remain for the kingdom of Strathclyde the modern counties of Lanark, Ayr, and Renfrew, on the South of the Clyde, and, probably, Dumbartonshire on the North. This last, including the city of Alclyde itself, was not originally British territory, for we are expressly told by Beda, that in former times, before the settlement of the Scots in Britain, the Frith of Clyde separated the Britons from the Picts. In his own time, however, he informs us, the Britons possessed the impregnable city of Alcluith, on its Northern shore. "The Scots, also, arriving on the North side of this gulf, had formed a settlement there." The capital of the Strathclyde Britons was thus placed between the territories of the Scots and Picts, the former of whom occupied Argyleshire, and the lower district of the Clyde, whilst the latter still retained the dominion of the Eastern side of the island, from the Forth Northwards. The position of Alclyde beyond the deep-water barrier of the Frith, on which it stands, was doubtless of the utmost importance to the Britons, in their struggles for independence with the Saxon kings of Northumberland. When their rich lands in Clydesdale were overrun, they could still maintain the contest with their baffled pursuers, in this rocky fastness, although, even here, the Saxons, in alliance with the Picts, on one occasion, succeeded in capturing their stronghold.

Chalmers places at the head of his series of Strathclydian kings, *Nau* or *Cau*, * the reputed father of Gildas, but if Nau is entitled to any place at all in authentic history, it is on the authority of a Life of Gildas, in which he is represented as a Scottish, and not a British prince. Huail, his son, is said to have been driven from the throne by the celebrated king Arthur, and though we must receive this statement with caution, as based on very meagre testimony, it is by no means inconsistent with the account given by Beda, of the successive occupations of the district North of the Clyde, by the Picts and the Scots, and the subsequent acquisition of Alclyde by the Britons. Nau, in this case, must have been contemporary with the earliest Scottish settlers on record, as Arthur appears to have commenced

* See the Life of Gildas, prefixed to Mr. Stevenson's edition of that writer; also, the Life of Gildas, by Caradoc, of Lancarvan. Both are manifestly apocryphal as regards Gildas, but it does not necessarily follow that the historical personages who are introduced are unreal.

his reign towards the close of the fifth century, and Fergus, the son of Erc, the founder of the Scottish dynasty, at the beginning of the sixth. However this may be, tradition has connected Arthur with the South and South-west of Scotland, and the North of England, and the local nomenclature affords many traces of his fame, especially in the case of this very citadel of Alclyde, or Dumbarton, which is styled "Castrum Arthuri," in a record of the reign of David II.*

The battle of Badon, the crowning exploit of Arthur's career, is placed by the most trustworthy authorities, in A.D. 516, and it is probable that he did not survive it many years. If he were really king of Strathclyde, it is not likely that he was the immediate predecesssor of Morken, as the latter was still living in the reign of Hussa, king of Bernicia, at least sixty years later. The names of the intervening reguli, however, no where occur, nor is their loss of much importance. Ryderic, his successor, died in 601, in the eighth year of the reign of Ethelfrith, king of Northumberland. Two years later occurred the signal defeat of Aidan, king of the Scots, at Dawston, and it is probable that the subjection of the Britons was the immediate consequence. At all events, during this and the succeeding reign of Edwine, we hear nothing of the independent existence of this people, nor do we even know the names of their chieftains. The same state of dependent inaction prevailed during the reign of Oswald, but in the very year of his disastrous death, A. D. 642, we find the Britons carrying on important military operations on their own account, in which Owen their king distinguished himself, by slaying on the battle-field of Strathcarmaic, Donal Break, king of the Scots. During the long reign of Oswi, in Northumberland, we read of one king of Strathclyde, Guiret, but the record is only of his death, A.D. 657, not of any exploits which he performed.

On the death of Ecgfrith, A.D. 670, the Britons, as we have seen, recovered their liberty, and henceforward we have a tolerably complete list

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* See Chalmers' Caledonia, Book II. Chapter ii., in which he gives a variety of local names derived from king Arthur. To this list many additions might be made. Chalmers also gives a list of the kings of Strathclyde, from the Ulster Annals, Symeon of Durham, &c. See also Ritson's "Annals of the Caledonians, Picts and Scots," in which he has inserted whatever he has been able to collect, relative to the various tribes who have at any time dwelt within the limits of modern Scotland, as well from the classic authors, as the mediæval historians, and the Lives of the Scottish and British Saints.

of the kings of Strathclyde, with notices of their conflicts with the Scots, Picts, Northumbrians, and Danes, during the two succeeding centuries.

In the year 869 Alclyde was utterly destroyed by the Danes; and henceforward the Northern Britons are no longer distinguished in the Ulster Annals as of Alclyde, but of Strathclyde, from which we may infer that the citadel was never rebuilt, if, indeed, they continued to retain any territory north of the Clyde. In 872 we are briefly told by the same authority, that Artga, king of the Strathclyde Britons, was slain at the instance of Constantine II. of Scotland. The motives which prompted this sanguinary act may be gathered from a notice in the antient Pictish Chronicle, published by Innes, from which we learn, that Ku, who had married the sister of Constantine, ascended the vacant throne. After the death of Constantine and his brother Aodh, who reigned after him a single year, Eocha, the son of Ku and nephew of Constantine, succeeded to the crown of Scotland, as well as of Strathclyde, A D. 882. Eocha was a minor under the tutelage of Gregory, or Grig, to whom he was indebted for his accession to a throne rendered vacant by the death of Aodh in battle. Gregory was so distinguished by his prowess and the success of his arms, that he is represented by most of the Scottish historians, not as the regent, but the king of that country, and his exploits are magnified beyond those of any of his predecessors. Whatever amount of exaggeration we may attribute to the accounts of his conquests in England and in Ireland, there is every reason to believe that the history given by Fordun, of his peaceful acquisition of certain British provinces, is entitled to credit. "The indigenous inhabitants," we are told, "of certain provinces voluntarily submitted themselves to Gregory, with their lands and possessions, thinking it preferable to be subject to the Scots, who, although enemies, were Christians, than to infidel pagans." These "Indigenæ" must have been the people of Galloway, and of the district around Carlisle; for the Strathclyde Britons, the only other people within the sphere of his influence, to whom the designation could be applied, were already under his authority as the guardian of Eocha. The transaction is what might have been expected from the relative position of the parties, for nothing was more natural than that two petty states, too weak to defend themselves from the hateful aggression of the Danes, and deprived of the protection of the Saxon kings of Northumberland, who had themselves succumbed to the common enemy, should turn for aid to the only neighbour who seems sufficiently powerful

to resist the invaders. The vigour of Gregory, however, was inadequate to support his usurped authority, and after holding the reins of government eleven years, he was expelled, together with Eocha, by Donal the son of Constantine, A.D. 893. To Donal, who was slain by the Danes in 904, succeeded Constantine III., the son of Aodh, who was slain by Gregory. Four years before his accession to the throne of Scotland his brother Donal had been "elected" king of the Strathclyde Britons, on the death of another Donal, who was probably the immediate successor of Eocha. During the life of Donal the districts of Carlisle and Galloway were not united to Strathclyde, but remained attached to Scotland; from which, however, they were separated after his decease, and given to his son and successor, Eugenius. To this new kingdom, thus founded by Constantine in favour of his nephew and presumptive heir, by the union of Carlisle and Galloway with Strathclyde, was given the name of Cumbria, derived from Cumbri, the common appellation of its inhabitants. Its extent is precisely defined in a return made by the prior and convent of Carlisle to a writ of Edward I., requiring them, as well as other religious houses, to furnish, from chronicles or other documents in their possession, any information bearing upon the alleged right of supremacy over Scotland vested in the English crown. The return sets forth that "That district was called Cumbria, which is now included in the bishoprics of Carlisle, Glasgow and Whitherne, together with the country lying between the bishopric of Carlisle and the river Duddon;" in other words, the entire tract from the Clyde to the confines of Lancashire. In the "Inquisitio Davidis," which does indeed extend to all parts of Cumbria which remained in David's possession, we are expressly told that "he had not then within his dominion the whole Cumbrian region," the present county of Cumberland, or as it was then called, of Carlisle, having been severed from it soon after the Norman conquest. Although Fordun is the only author who narrates the cession of Carlisle and Galloway to Gregory, and the subsequent grant of these districts by Constantine to Eugenius, whereby they were united to Strathclyde, and the whole merged in a single government, we have abundant evidence of the existence of Cumberland and the intimate union of Constantine and Eugenius at this period. In the year 938 these princes, in conjunction with the Danes and Welsh, attempted to wrest the sovereign power out of the vigorous hands of Athelstane. The combined forces were signally defeated by the Anglo Saxon monarch at Brunanburgh;

Eugenius was slain, and Constantine escaped only by a precipitate retreat.

Edmund having completely wasted Cumberland, placed it at the disposal of Malcolm, king of Scotland, an acknowledgment, it would seem, of the right of the Scottish crown to that territory, and a presumptive proof of the accuracy of Fordun's narrative.

From this period, Cumberland continued in the possession of the royal family of Scotland, sometimes retained by the king himself, at others, held by a member of his family; usually, if we may credit the national historians, by the proximate heir. The only circumstance which is recorded of it for many years, is its total devastation by Ethelred, king of England, A.D. 1000, at which time it is represented by Henry of Huntingdon as the principal rendezvous of the marauding Danes. In 1052, Macbeth held the Scottish throne, whilst Malcolm, the son of his predecessor, Duncan, sat on that of Cumberland. Siward, Earl of Northumberland, was commissioned by Edward the Confessor to invade Scotland, and avenge the "murder" of Duncan. In this he succeeded, defeated and slew Macbeth, and placed the king of Cumberland, or, as some historians assert, his son, on the throne of Scotland. This Malcolm, surnamed Caenmore, held at the time of the conquest, Cumberland and Lothian, in addition to the ancient kingdom of Scotland. During the reign of William the Conqueror, the Earldom of Carlisle, containing the present county of Cumberland, and part of Westmoreland, was severed from Malcolm's possessions, and the existing limits established between England and Scotland. The kingdom of Cumbria was thus reduced to the dimensions indicated in the Inquisitio Davidis, and was held as a principality dependent on the crown of Scotland. Lothian, on the contrary, was held by the successive kings of Scotland, as a feof of the crown of England, and Odericus Vitalis says it was for this province, and neither for Scotland, nor for Cumberland, that the much contested homage was due.

Having thus traced the history of Strathclyde, Galloway, and Carlisle, from the remotest period, respecting which any information is to be found, down to their amalgamation, under the name of Cumbria, and the ultimate division of that territory between England and Scotland, it remains to collect such traces as exist of the condition of the district between the Duddon and the Mersey,

So long as the native chieftains were allowed to exercise a subordinate

authority, the Northumbrian kings had no occasion to interfere with the internal government of the subject provinces. If the tribute was duly rendered they remained unmolested; if it was withheld, payment was enforced by arms; or, in extreme cases, the refractory state (to use a modern phrase) was "annexed," as we have seen in the instance of Elmet. When, however, the domestic government was extinguished, it was necessary to provide a new administrative machinery. Accordingly, at the very period to which, on other grounds, we have assigned the extermination of the native dynasties in Lancashire, Cumberland and Galloway, we find for the first time in the Northumbrian annals, the appointment of a new class of officers, who are variously styled by Beda—"tribuni," "duces," and "præfecti"—whose administration appears to have extended not only to the Britons, but to the subject Picts, and even to the Irish, who were partially subdued by Ecgfrith. After his reign and the contraction of the territory of his successors, the authority of these officers was necessarily confined to the Britons. Henceforward the names of several "duces," or as they are termed in the Saxon Chronicle, "ealdormen" occur, but the only one whom we can distinctly identify as connected with Lancashire is Wada, whom we find in the year 798 stationed in the neighbourhood of Whalley, which, as well as Manchester, is expressly stated in the Saxon Chronicle to be in Northumberland. The grounds on which Dr. Whitaker contends against this direct historical testimony, that the Ribble and not the Mersey was from the first the south-western boundary of Northumberland, are, first, that the district between these rivers formed part of the Mercian diocese of Lichfield, and not the Northumbrian diocese of York; and, second, that the local nomenclature bespeaks the Mercian dialect to the south of the Ribble, whereas the Northumbrian prevails on the north. But surely both these circumstances are consistent with the supposition that the territory between the Ribble and the Mersey was taken from Northumberland by Edward the elder, and annexed to his own dominions, when he directed the occupation of Manchester in 923. It is natural to suppose that he would unite his new acquisition to a bishopric within his own dominions; and the only authority which Dr. Whitaker adduces in support of his assertion, that it was always a portion of the diocese of Lichfield, is a document which he cites under the title of "Status de Blackburnshire," to which he does not attempt to assign an earlier date than the fourteenth century.

As regards the etymological argument, it may be remarked, that the dialectic differences of speech between the Mercians and Northumbrians did not originate in any diversity of race in the first instance, for both were Angles, but were introduced when Northumberland was overrun by the Danes, to whose vocabulary nearly every peculiarity of the Northumberland dialect may be traced. Although it may be true of Northumberland generally that it was parcelled out amongst the Danish invaders as early as the year 876, it is probable that many years would elapse before any actual colonization could be effected in this quarter—the most remote of all from the basis of their operations on the Tyne. In the mean time the occupation by Edward the elder effectually secured it from molestation.

During the long period which intervened between the reigns of Ecgfrith and Edward the elder, there can be no doubt that a considerable Saxon population was introduced; the land probably was enjoyed almost entirely by Saxons, still, perhaps, the great body of the inhabitants were of the old British stock. Had it been otherwise the district would either have been formed into a county of itself, or have been incorporated with some other county. That such was not the case even at the period of the Norman Conquest we know on the unquestionable authority of Doomsday, in which it appears, not as shire-land, but as a detached possession of the crown, under the title of "Terra inter Ripham et Mersham." This invaluable document affords additional confirmation to the views expressed above, first, that this district was originally part of Northumberland; second, that it had, at a later period, been united to the monarchy of England. Of the former proposition we have proof in the prevalence within its limits of the ancient tenure of Drengage, of which we have no instance beyond the bounds of Northumberland: of the latter in the circumstance, that whilst the country to the north of Ribble, itself no part of any county, is appended, in the survey, to Yorkshire, the "Terra inter Ripham et Mersham" is appended to Cheshire, which was always recognized as within the province of Mercia.

Seven years afterwards, we learn from Roger of Wendover, that Edmund, king of England, with the aid of Leoline, king of South Wales, ravaged the whole of Cumberland, and put out the eyes of the two sons of Dunmail, king of that province. Dunmail, himself, seems to have escaped. He was probably the son of Eugenius, or Owen, the preceding king, and the same person who is described as Dunwallon, "the son of Owen," and who died at Rome thirty years afterwards. In the annals of Ulster, indeed, this Dun-

wallon is described as king of Wales, but Caradoc calls him prince of Strathclyde, and his patronymic designation seems to identify him with Dunmail, if, as we assume, the latter was the son of the first king of Cumberland.

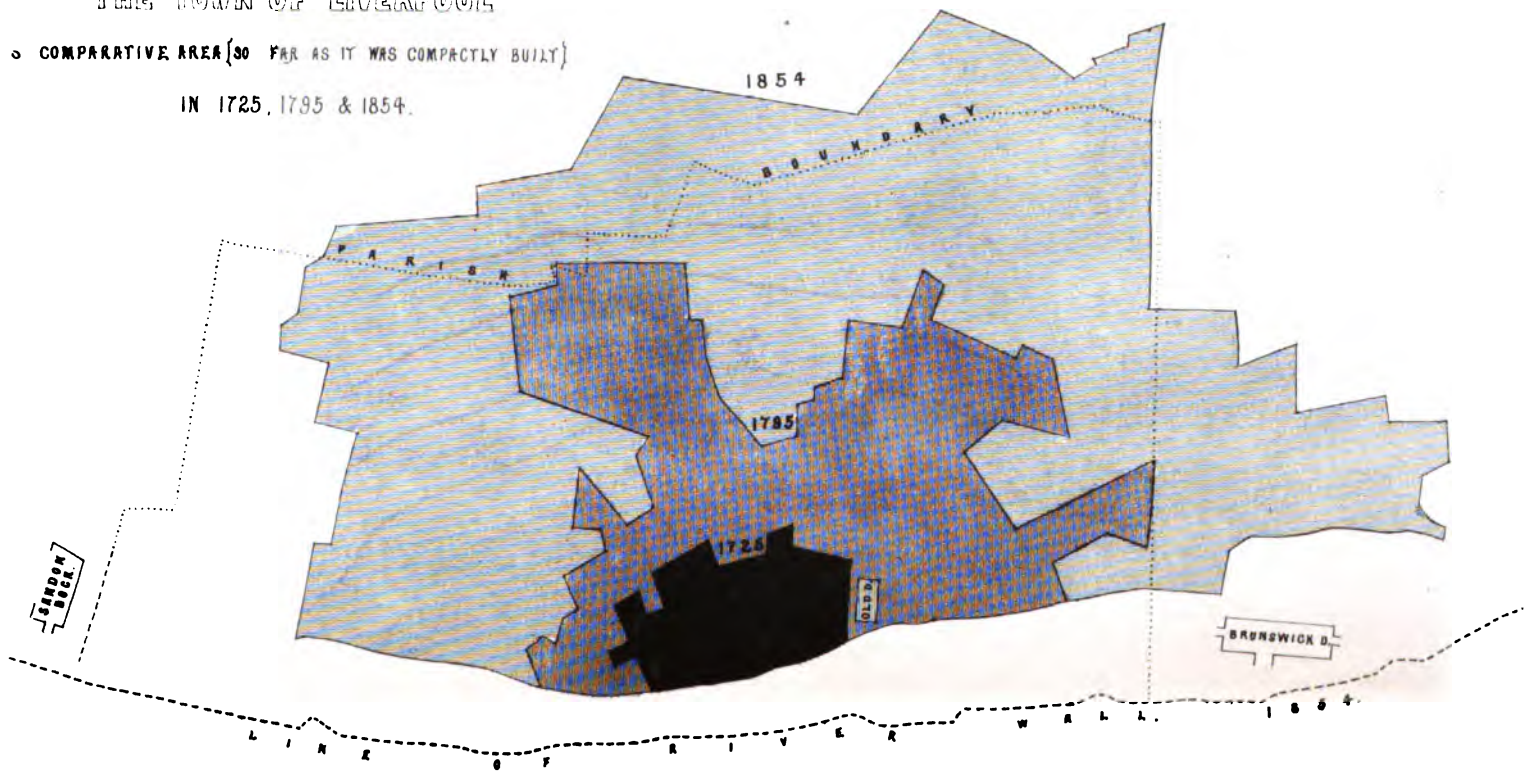
The Northern part of Lancashire, which is described in Doomsday as Agemundrenessa (Amounderness) continued, after the abolition of the royal dignity in Northumberland, A. D. 952, under the government of the Earls of that province. One of these, Eadulf, about a century after the above date, is accused by Symeon of Durham, of committing savage atrocities amongst the Britons. These may either have been the British inhabitants of his province, or the neighbouring people of Cumberland. We know that a small district of the latter county, beyond the Duddon, was brought under the dominion of the Northumbrian Earls, and is described in Doomsday as part of Amounderness, in which is included also the Barony of Kendal, which forms a moiety of the present county of Westmorland. The whole district is returned as the property of the Crown, the greater part having been held, in Edward the Confessor's time, by Tosti, Earl of Northumberland. In fact, up to the period of the Conquest, the "Terra inter Ripam et Mersham," and Amounderness, appear to have been two vast seignouries or honors, the one appertinent to the Crown of England, the other to the Earldom of Northumberland, within which existed many manors and estates, held by private individuals, both under free and servile tenures. For a short period after the Conquest, the whole of the Southern seignoury, and a large portion of the Northern, were held by Roger of Poitou, but had reverted to the Crown before the Doomsday era. It is remarkable that the district of Cartmel, although it lies directly between the main body of the county of Lancaster and Furness, which is described as part of Amounderness, is unnoticed in Doomsday. From the period of the grant of this district by king Ecgfrith to Saint Cuthbert, not a trace is to be met with, either of Cartmel or its population of Britons, till the year 1188, when a Priory was founded here, by William Marshall, Earl of Pembroke. Long before that, it is probable that the distinctive features of a Celtic people had disappeared, not only here, but throughout Lancashire. Even in the Doomsday survey, there is little in the names of the proprietors, or in any other particular, to remind us how large an amount of Celtic blood must still have been diffused amongst the natives of that county. We might almost be led, from this consideration, to suppose that a system of extermination must have been pursued towards the Indi-

genæ, had we not found the same state of things to exist in Strathclyde, where the Britons were so long not only the most numerous, but the dominant race; and yet in the course of a few generations, there is little to distinguish the Strathclydians from the Saxon people of the neighbouring counties. Wherever a Celtic people have remained isolated, as the Welsh, the Highlanders of Scotland, and the Irish, they have preserved with wonderful fidelity the characteristics peculiar to their race; but where they have mingled with alien tribes, they have invariably received the impress of those with whom they came in contact, rather than imbued those with any portion of their own national peculiarities. Of the British communities between the Mersey and the Clyde, the only people who preserved anything of their Gælic features, a century after the Conquest, were the Galwegians, and these, though of a cognate race, appear to have been less the descendents of the ancient British population, than of the Pictish immigrants of the eighth century. Their intercourse with other districts was, from the nature of their position, extremely limited, and even after their nominal subjection to Scotland, they remained under the immediate dominion of their own lords.

In Lancashire the case was very different. So long as the "Terra inter Ripham et Mersham" remained a part of Northumberland, the communication with other parts of that state was indeed difficult, separated by a ridge of lofty moors which were not then rendered accessible by the skill and science of engineers; but the circumstances were completely changed when it was annexed to the same state to which the neighbouring county of Chester belonged. No greater obstacle then existed to the utmost freedom of communication, than a river easily passable at all points, in boats, and in its upper portion by fords or bridges. A little later, the same facilities which enabled Saxon enterprise to cross the Mersey into South Lancashire were extended to its farther progress across the Ribble into Amounderness, when that district also was severed from the Northumbrian earldom, and placed under the central government of England. If in the Earldom of Carlisle, in which the authority of the central government was neither exercised nor acknowledged, the language and usages of the Britons had yielded to Saxon influence, it is not to be supposed that they would maintain their ground in Lancashire under circumstances so much less favourable to their perpetuation

THE TOWN OF LIVERPOOL

COMPARATIVE AREA (SO FAR AS IT WAS COMPACTLY BUILT) IN 1725, 1795 & 1854.



LIVERPOOL:

MEMORANDA TOUCHING ITS AREA AND POPULATION,

DURING THE FIRST HALF OF THE PRESENT CENTURY.

By J. T. Danson, Esq., F.S.S., Vice-President.

(READ ON THE 8TH NOVEMBER, 1855.)

I.

The sources of information commonly referred to, as to the population of Liverpool, are two. There is the National Census, taken in 1801, and at intervals of about ten years ever since. This serves for the present century. And for the preceding century there is an account compiled for, and presented to, the Commissioners appointed in 1833, to enquire into the state of the Municipal Corporations of the country, and which was printed in the Appendix to their Report, published in 1835.

From the latter source we learn that the population of the town of Liverpool was, at eleven different periods, beginning in 1700, and ending in 1790, as follows:—

	Persons.	Shewing an apparent average annual addition of
In 1700...	... 5,715...	... ... —
1710...	... 8,168...	 245
1720...	...11,833...	 366
1730...	...12,074...	 124
1742	...18,000...	 493
1752...	...18,500...	 50
1766...	...25,787...	 520
1770...	...35,600...	2,473
1777...	...34,107...	... ...(a loss)
1786...	...41,600...	 832
1790...	..55,732...	3,533

In 1801, the Census gave for Liverpool a total of 77,653 persons, shewing, for the eleven years, 1790–1801, an average annual increase of 1,992 persons.

It does not appear upon what area, precisely, any of the eleven enumerations prior to 1801 were made. And from the apparent use of round numbers in four out of the eleven statements, we may fairly infer that some of them were based upon mere estimate, and were not the result of, or based

upon, any actual enumeration. The great irregularity of the rate of increase between some of the periods, exceeding what has been recorded as of ascertained occurrence under similar circumstances, also affords ground for suspecting the accuracy of the eleven statements; and as we have no reason for placing more reliance upon any one of the statements than upon any other, any suspicion raised by the irregularity of the results, tells, more or less, against the whole.

Not wholly without explanation, however, is this irregularity. Reference to cotemporary history, and especially to the history of the commerce of the port of Liverpool, reveals something like corresponding changes in the prosperity of the town.

It will be observed that the first remarkable increase of the population took place between 1752 and 1766; and that this was followed by a still greater increase between 1766 and 1770. The first of these dates marks the period at which it would appear that the Slave-trade began to be carried on largely by the merchants of Liverpool. The British share of this trade seems to have been most extensive about the year 1771. After that period it declined; the supply to the West Indies having so far overtaken the demand, as to reduce the selling price, and render the profits of the trade both smaller and less certain than before.

The decline of the Slave-trade had scarcely been ascertained, when the trade with the North American colonies was stopped by the outbreak of the war of 1775–83. Accordingly, we find the population of 1777 less than that of 1770; and at the next period (1786), three years after the trade was opened with the United States, the increase shewn is but small. Soon afterwards several causes combined to augment the trade of Liverpool. In September, 1786, a very liberal Treaty of Commerce was concluded between Great Britain and France; and it continued in force till war broke out between the two countries in February, 1793. And from 1783 to 1793, the shipping of Liverpool, which for some seven years previously had found in privateering the most inviting, if not the most profitable, form of employment, was fully engaged in carrying on a rapidly increasing trade, arising principally from the early but already rapid growth of the cotton manufacture, and stimulated by a degree of freedom in the commerce of Europe, such as had not been known before, and has scarcely been equalled since.

It forms, however, no part of my present purpose to ascertain the popu-

lation of Liverpool prior to the present century, or to deal with prior records, except in so far as these may throw light upon the more recent period. And having now scanned, though somewhat cursorily, such data as we possess of the growth of the population during the eighteenth century, we are enabled to mark a degree of coincidence between the figures relating to the hundred years 1701–1801, and the fifty years 1801–51 which is at least remarkable. If we accept, as nearly correct, the eleven statements already given for the former period, it appears that the population of the town was increased in the first fifty years of the century by about 250 per cent on its amount at the commencement. In the next fifty years, 1751–1801, it would appear to have been nearly the same. And in the third fifty years, 1801–51, it was also very nearly the same. Thus—

Population of 1700, by statement...	5,715
Add for apparent increase in one year	245
Apparent population in 1701...	5960
	3.5
Computed population in 1751	20,860
	3.5
The like in 1801	73,010
	3.5
The like in 1851	255,535

The numbers actually stated above, and by the census of 1851, being—

In 1752 ..... 18,500;——1801 ..... 77,653;——1851 258,236

Should the same proportion hold through the fifty years now current, the population in 1901 will be upwards of 900,000. In other words, that will be about the number of the inhabitants of Liverpool when the children of the present day, destined to live so long, shall have reached their fiftieth year.

II.

The town of Liverpool may be said to appear in the Census for 1851 in two forms. First is given the population of the *parish* of Liverpool; of which I may observe that its limits are coincident not only with those used for the Census enumeration, but also with those of the district established in 1836 for the registration of births, marriages, and deaths.

We have, also, in the previous five Censuses, the population of the same

district in 1801, 1811, 1821, 1831, and 1841. We have, therefore, six actual enumerations upon the same area, as follows :—

	Persons.	Shewing an average annual increase of
In 1801...	... 77,653	
1811...	... 94,376...	...1,672
1821...	...118,972...	...2,459
1831...	...165,175...	...4,620
1841...	...223,003	...5,782
1851...	...258,236...	...3,523

Here it would seem that the rate of increase was materially reduced between 1841 and 1851, as compared with the previous decennial periods —a result we are by no means prepared for, as indicating a corresponding abatement in the actual growth of the population of the town. But it is accounted for when we remember that we are not now dealing with the population of the town (properly so called), but with that of the parish ; and that the town has, undoubtedly, of late years, outgrown the limits of the parish. This enumeration, therefore, does not afford a complete view of the town in 1851; and, perhaps, not even in 1841. And as we have no reason for assuming that the limits of the parish were coincident with the limits of the town proper at any of the previous Censuses, we are compelled to reject these figures as unfitted, in their present form, to furnish a just conception of the population of the town at any period in the half century.

But Liverpool appears in the Census of 1851 in another form. The Registrar General has taken the population for 1851, and also for 1841, within the limits of the parliamentary and municipal borough. No enumeration within these limits was, or could have been, made in 1801, 1811, 1821, or 1831, as they were not fixed till the passing of the Reform Act, and the Municipal Corporation Act, between 1831 and 1841. But the Registrar General has supplied the omission by an *estimate* of the population existing in 1801, 1811, 1821, snd 1831, upon "nearly the corresponding area."

The results are :—

	Persons.	Showing an average annual increase of
For 1801...	... 82,295	
1811..	...104,104...	...2,180
1821...	...138,354...	...3,425
1831...	...201,751...	...6,339
1841...	...286,487...	...8,473
1851...	...375,955...	...8,846

Here again we find the rate of increase less between 1841 and 1851 (in proportion to the previously existing population) than it was between 1831 and 1841.

And again we are reminded that the limits thus taken through the entire period of fifty years were not those of the town properly so called, and cannot even be supposed to have coincided with the real boundary of the town at any time within that period—seeing that extensive tracts of land which cannot be deemed to have formed part of the town are known to have existed, even in 1851, within the limits of the parliamentary and municipal borough.

The whole extent of the parochial area has been ascertained to be 2,220 acres. This is reduced by the necessary deductions for *water* (fixed by the estimate of Colonel Dawson, of the Tithe Commission, at the request of the Registrar General) to 1,560 acres.

The precise extent of the municipal and parliamentary limits referred to by the Register General, I have not been able to ascertain; but they would seem to be about 4,400 acres, thus :—

	Acres.
The Parish of Liverpool, (exclusive of water,) ...	1,560
The Township of Everton	700
The Township of Kirkdale	702
The Township of Toxteth Park, (part,) estimated,	800
The Township of West Derby, (part,) estimated,	680
	4,442

Both these areas are, however, liable to an objection which I cannot but deem insuperable. Both are uniform through the whole period. Both, therefore, are based on the assumption that the population of the town was spread over the same area during the entire fifty years—an assumption notoriously at variance with the facts. Both, therefore, must be rejected.

III.

Having rejected the areas assigned to the town at successive periods, by the only authorities to which we can look for information touching the population, we have now to seek some other, more consistent with the principle on which the rejection has been made. That principle is one too

simple and obvious for dispute. It is that the area of the town must, in the absence of evidence to the contrary, be deemed to have increased with the population. Whence we are bound, in view of the returns before us, which undoubtedly indicate a constant increase of the population, to assign to the town, at each decennial period, some reasonable increase of area. How this may be done, with the materials before us, and with the nearest apparent approximation to accuracy, is the problem I have to submit to you this evening.

I shall first lay before you the data on which we have to proceed; then describe the method I have adopted to elicit the required information; and, finally, state to you the result.

But first let me define what I mean by a term which occupies a very prominent and important place throughout this paper: let me say what I understand by the word Town. I assume, then, that a Town is an aggregate of the general population of the country which differs from the rest, so far as we are at present concerned with it, only in *its greater density*.

Of the 624 districts into which, for the purpose of the Census enumeration of 1851, the whole of England and Wales was divided, I find that one (East London) was peopled at the rate of 185,751 persons to a square mile, or about 290 to an acre; while another (Bellingham, in Northumberland,) had only 18 to the square mile. These were the extremes; they were in point of density, as more than 1,000 to 1; and the other 622 districts exhibit nearly every degree of density between these two. The question which now presents itself is this: What degree of density shall be held to constitute "Town," as distinguished from "Country"? The average density of the Parish of Liverpool, in 1851, was about 165 to the acre. But of the seven sub-districts into which the Parish is divided, some had a higher, and some a lower, density than this. And it is probable, that had the parts of the Town lying beyond the limits of the Parish been separately enumerated, they would have been found to possess a density lower than the average of the Parish.

This brings us to a further consideration. We know, from observation, that beyond the limits of all our towns, however these limits may be laid down, there is a surrounding district, more or less extensive, which, though it be not included in the town, can scarcely, with propriety, be deemed "country." To these districts we are accustomed to apply the term

"suburbs." Further, it does not admit of dispute, that the suburbs belong much more to the town around which they are gathered, or rather from which they emanate, than to the country, with which, by a too narrow definition of the word "town," they would be confounded.

The results of any adequate consideration of this topic could not be expressed here without carrying us beyond the scope of the present paper. The growth of towns in England and elsewhere, its methods, its causes, and its consequences, has not yet received the care it deserves from those who are disposed to seek in the best known and least disputable phenomena of human society the surest and safest indications of a wise general polity. Familiarity, without attention, deadens the observing faculties; and the dwellers in towns are yet less observant in this direction than at first sight would seem likely. It is not disputed that a square yard of stone wall, covered in the course of half a century with patches of moss and lichen, affords a study not unworthy of an adequate exercise of the human faculties. Nor can it be disputed that a map of any part of Europe of the same size, accurately shaded to represent the growth of the town population during a similar period, affords a spectacle of similar, but higher interest—and one even more worthy of scientific investigation. To be successful in the study of either we must approach it in the same spirit. The particular facts will be of a very different order; yet discreetly to use them, in tracing the effects we see to their causes, demands precisely the same methods of reasoning.

But the work is not yet begun. Hence I am compelled either to abandon my present purpose, or to proceed by a method more or less empirical. The former would give no result. The latter may give one as good as can at present be attained. And, its basis being obvious, it cannot have any deceptive effect.

After well considering, then, all the circumstances which seem to me to bear upon the meaning of the word "town," I have assumed that to justify its application there should be, upon the whole area in view, an average of not less than 100 persons to the acre.

For the suburbs of a town I assume a similar average of ten persons to the acre.

The method of applying this definition I shall have occasion to refer to presently.

The data now before me consist of a return of the area and population of every "enumeration district" near enough to the parish of Liverpool to have contributed, with any degree of probability, to the formation of the town or its suburbs at each of the six enumerations of 1801, 1811, 1821, 1831, 1841, and 1851.

Those I have selected consist of twenty-one townships besides the Parish of Liverpool—thirteen on the Lancashire and eight on the Cheshire side of the Mersey. For it will be observed that my definition rests simply upon the density of the aggregation; and, on considering the nature of the division effected by the River Mersey, I have seen no reason for excluding from view, as part of the town, whatever must be deemed so in fact, whatever it may be in name.

These twenty-one townships are shown in the following table:—

DISTRICT.	Total Area, exclusive of Water.	Computed distribution of area in 1851.		
		Town.	Suburb.	Country.
	Acres.	Acres.	Acres.	Acres.
In Lancashire:—				
Parish of Liverpool.....	1560	1560	—	—
Kirkdale Township	702	48	500	157
Everton „	700	210	492	—
West Derby „	6123	250	500	5373
Wavertree „	1796	—	311	1485
Toxteth Park „	2333	556	500	1270
Bootle „	1171	—	352	819
Waterloo „	1886	—	152	1734
Garston „	1628	—	194	1434
Great Crosby „	2117	—	134	1983
Litherland „	1179	—	166	1013
Much Woolton Township ...	930	—	315	615
Little Woolton „ ...	1200	—	41	1159
Huyton „ ...	1630	—	48	1582
Totals in Lancashire...	24955	2624	3705	18624
In Cheshire:—				
Birkenhead Township.....	900	188	500	212
Tranmere „	1174	10	500	664
Oxton „	802	—	160	642
Claughton „	436	—	49	387
Liscard „	896	—	365	531
Poulton-Cum-Seacombe	669	—	271	398
Higher Bebbington.....	899	—	102	797
Lower Bebbington	1052	—	96	956
Totals in Cheshire	6828	198	2043	4587
Totals in both Counties.	31783	2822	5748	23211

This places nearly one-fourteenth part of the *Town* on the Cheshire side of the Mersey in 1851. At the same date a little more than one-third of the *Suburbs* appear on the same side. But it is also obvious that a large proportion of these Cheshire suburbs were, (prior to 1851,) more likely to form new additions to the Town area than to continue extending in the suburban form. And this tendency has since received a new impetus in the renewal of the Birkenhead Dock Works.

The mode of computation by which the figures in the last three columns of this table were elicited from the data afforded by the Census of 1851 is easily explained.

The twenty-one townships selected adjoin Liverpool, and were each taken as presenting a higher density of population than seemed consistent with the assumption that it was entirely "country." Here, however, it was necessary to fix upon some degree of density, excess of which should bring the examined townships within the list. And, in approaching this part of my task, I observed that though there might possibly have been an equality of density in the town population of England during the fifty years in view, no such equality could be consistently looked for in the rural districts, especially those in the immediate neighbourhood of towns. Hence the necessity for a maximum *country* density as a basis, and one that should increase at every decennial period. After well considering the claims of simplicity and of probable accuracy, I adopted the following method of fixing this test. I took, first, the aggregate population (as given by the Registrar General, upon a basis which I cannot deem very accurate, but which may be sufficiently so for the present purpose) of the fifty-two towns enumerated in the two counties of Lancashire and Cheshire in 1851 The fifty-two towns contained a total population of 1,572,316 persons. Deducting this from the total population of the two counties at the same time (2,490,817) we have a remainder of 918,501, for the rural population. This, taken in connection with the space occupied, may be deemed to afford an approximate notion of the density of the country population at that period; and one which is probably below, rather than above, the actual density in the parts nearest the towns. Then, as to the rate of increase of the country density, I find that had Lancashire and Cheshire been peopled in 1851 only at the rate common to all England and Wales (including the towns) they would have contained rather fewer persons altogether, than is thus attributed to their country parts alone. In other words, there is, in

the average density of England and Wales, a close analogy to that of the country parts of Lancashire and Cheshire (as stated for 1851 by the Registrar General). And, in the absence of any better guide to the density of the rural districts of Lancashire at previous Censuses, I assume that something not very far removed from the same analogy has existed throughout the fifty years in view. Acting on this assumption, I take for the maximum average density of the country immediately surrouuding the suburbs of Liverpool—

In 1801	... ...	25	persons per square mile
1811	... ...	30	,, ,,
1821	... ...	35	,, ,,
1831	... ...	40	,, ,,
1841	... ...	45	,, ,,
1851	... ...	50	,, ,,

It may be objected that, while admitting an increasing density in the surrounding country I assume an uniform rate for the suburbs. This I do, because I see reason for believing that the tendency to increased density in the suburbs, for the time being, has been constantly counteracted by an increasing facility of communication. And as the leading causes of the formation of suburbs are intimately and obviously allied with the facility of transit thence, to and from the central parts of the town, it may even be doubted whether the average density of population in the suburbs of our larger towns has not, during the last half century, rather diminished than increased.

With the densities thus assumed to be due, respectively, to town, suburb, and country, each district, as presented by each census, has been examined in succession, and the excess apparent beyond the average due to a country district put aside as indicating the existence of a corresponding extent of suburb, or town, or both. The extent of each is at once determined by the amount of the excess. Continuing this process through the successive decennial statements, the assumed growth of the suburban portion of each district is stayed whenever it is found to have covered an area of 500 acres: that being deemed, from observation, about the point at which the formation of the denser aggregate of a town would commence on the interior borders of the suburb. The suburb, then, being maintained at this extent, so long as the extent of the district permits it, any further surplus is carried to the formation of an addition to the central *town*, at the average rate of 100 persons to an acre. And so on, till every

district in the list has been examined, and computed, for each of the six decennial enumerations.

The net results may be stated, shortly, as follows :—

YEAR.	AREA COVERED BY THE TOWN AND SUBURBS.		
	In Lancashire.	In Cheshire.	Total.
	Acres.	Acres.	Acres.
1801...	1,990	—	1,990
1811...	2,590	12	2,602
1821...	3,172	72	3,244
1831...	3,954	454	4,408
1841...	4,944	1,327	6,271
1851...	6,329	2,241	8,570

POPULATION OF THE TOWN AND SUBURBS.

YEAR.	TOWN.			SUBURBS.			TOTAL.
	Lancashire.	Cheshire.	Total.	Lancashire.	Cheshire.	Total.	
1801...	68900	—	68900	13010	—	13010	81910
1811...	87600	—	87600	17140	120	17260	104860
1821...	121800	—	121800	19540	720	20260	142060
1831...	176800	—	176800	21860	4540	26400	203200
1841...	203700	3100	206800	29070	12960	42030	248830
1851...	262400	19800	282200	37050	20430	57480	339680

The six decennial statements afford us five equal intervals, or periods of increase. And by marking the numbers added in succession, in each of these intervals, we obtain a somewhat clearer view than that afforded by the figures as they stand in the above table, of the varying rates of progress.

For instance, for the whole *Town* (omitting the suburbs) we find that the numbers added were :—

In the First decennial interval ... ... 18,700 persons.
Second „ ... ... 34,200 „
Third „ ... ... 55,000 „
Fourth „ ... ... 30,000 „
Fifth „ .. ... 75,400 „

Here there is a remarkable defalcation in the fourth period, or between 1831 and 1841.

Dealing similarly with the *Suburbs*, we find a different result; and one which accounts, in part at least, for the irregularity observed in the progression of the *Town*. The numbers added being:—

In the	First period	4,250
	Second „	3,000
	Third „	6,140
	Fourth „	15,630
	Fifth „	15,450

Here we have a considerable falling off in the second period, and a small one in the fifth. But we have a very large increase in the fourth: indicating the extensive formation of new suburbs between 1831 and 1841, the interval during which the growth of the Town proper appears to have been proceeding at a slower rate than usual.

Increased facility of communication across the Mersey has evidently changed the previous direction of the town's growth; and it would appear that the centre of the town, which down to 1831 tended to move *from* the river, has since been fixed; and is unlikely to move further in that direction.

The materials are too imperfect to warrant much further elaboration. The superficial form in which I have presented them is undoubtedly open to serious objections, in a scientific point of view. It may render somewhat more obvious, and somewhat more available, to those who do not look into the original records, the data we possess; but no method of treatment can cure the defects of these data, or educe from them the means of closely examining the actual growth of the town.

ON THE SAXON ELEMENT IN THE DICTION OF ENGLISH POETRY.

By David Buxton, Esq.,

PRINCIPAL OF THE LIVERPOOL SCHOOL FOR THE DEAF AND DUMB.

(READ 1ST NOVEMBER, 1855.)

The subject announced in the title of this paper, appears to me to present itself in two aspects, which are of equal interest. To the lover of literature, it is interesting, in its connexion with poetry; and to the philologist in its relation to language. One whose daily occupation it is to give a knowledge of the English language to those whose physical deprivation causes them to be utterly ignorant of all language, is naturally led to make himself acquainted, to some extent, with the sources and the materials of our mother tongue; and when, in the precious intervals of a busy life, he has been able to steal aside from the track of necessary duty, to snatch however transiently the joy which literature affords, it has only deepened the conviction which many will share with him, that there are no richer delights to be found anywhere, than in the ever "fresh fields and pastures new"* of English poetry.

I lay claim to no other qualifications for dealing with the present subject than such as these pursuits have afforded.

Now I believe that there passes current in the world a large quantity of respectable letter-press, under the name of poetry, which has not the smallest right to that honourable designation. We certainly have verse of every style, and upon every subject: as moralizing, it is most unexceptionable; as satire, it is most pungent; in its prosody, it is correct to a hair's breadth; its rhymes may be such as Pope himself might envy; and yet it is a complete misnomer to call it poetry at all.

If the theory which I shall enunciate is correct, it is a mistake to suppose that any work is necessarily a Poem, because it is written in rhyme, or in

* Milton. *Lycidas.*

blank verse; or that poetry has any necessary connexion with the trick of putting a nominative a dozen lines from the verb it governs, and filling up the intervening chasm with high-sounding words, woven into dislocated verse; or that there is any poetry in words, as such, apart from the idea which they appropriately embody, or the objects which they fitly describe.

The faults here indicated are perhaps not so current now as they were formerly. We have some lingering specimens of these vicious styles amongst us still, but they were carried to their greatest lengths by the writers of the Didactic School, who, aiming at a compromise between poetry and prose, succeeded in producing something which was neither the one nor the other. But, let us not deceive ourselves on this point. Though we may have fair ground for congratulation that this school of writers has almost become extinct amongst us, we must not, therefore, conclude that we are faultless. If it is the glory of some periods to have a title to greater eminence, and higher renown, than can be claimed for other times, it is not the less certain, that every age has its own characteristic failings. One observant critic will tell us, and with truth, that almost every grade, both of topic and of treatment, ranging between the familiar and the abstruse, is followed by our living writers; and another will add—what can scarcely be denied—that not only is this so, but these extremes are run out to their furthest limits, until, in the excess of our passion for common things, we find men singing in the slang of outlaws, and others soaring so very far into the regions of transcendentalism, that minds of ordinary stamp can only "toil after them in vain," and leave them at last, in sheer despair of following, to chant their unintelligible strain in their own way, to their own unalloyed, because unshared, gratification. So much for the affectations of fashion, and the mannerisms of the day. But poetry is independent of all these. Though sometimes "cribbed, cabined, and confined," and held down in ignoble slavery to the caprices of the time, yet there is that within her which speaks thrillingly and lives immortally—and she is beautiful even in her chains. How much the more, then, when fitly habited and adorned.

> .....a native grace
> Sits fair proportioned on her polished limbs,
> Veiled in a simple robe, their best attire
> Beyond the pomp of dress: for loveliness
> Needs not the foreign aid of ornament,
> But is, when unadorned, adorned the most. *

* Thomson's Seasons.

Yet it is not in words that the magic of poetry lies. It is in the ideas which are associated with those words. Poetry resides not in the outward form or dress of any man's conception, but in the idea so conceived. John Clare, the peasant-poet of Northamptonshire, has borne testimony to this truth in one simple and beautiful couplet—

> I found the poems in the fields;
> I only wrote them down.

If, therefore, the original idea, as it arises in the mind, is not, in itself, poetical, no powers of language, or supposed charms of diction, can ever make it so. As it is birth, and not dress or manner, which makes an Englishman, so it is the native thought, which is, or is not, poetical. No assumed dress or form can give to any mental conception a character which it does not naturally possess. Poetry is an essential, not an accidental, property. But it is absolutely requisite to the due development of poetic thought, and for investing it with full expressiveness and beauty, that it should be clothed in befitting language. The thought which would be striking for its impressiveness, or admirable for its beauty, may be made ineffective or ludicrous, either by the puerility or the pompous extravagance of its diction. What poetry seeks from language, is adequate and graceful expression. This being given, the feeling which burns in the heart of the poet will soon be responded to in the hearts of other men, and the kindling light of genius be felt and reflected in minds happily susceptible of those influences which make "the poet's pen" more potent than the wand of the magician.

The proposition which I shall endeavour to prove on this occasion is, that the proper dress of English poetry is that portion of the English tongue which is commonly distinguished and known as the Anglo-Saxon. If I were engaged in a strictly etymological enquiry, it would be my duty to analyse the composite character of our language more rigidly, and to define its lines of separation more closely, than is at present necessary. For though our vocabulary bears obvious marks of having gained its present flexibility and fulness by what it has drawn from *many* different sources, it is sufficiently accurate for our present purpose to take its main constituents to be two, and to assign the Norman conquest as the dividing point between them. The language which at that time began to be engrafted upon the original Anglo-Saxon, was adopted from the Latin, either immediately, and in tolerable purity, or through the Normans and French, with

the modifications of form which they had introduced. These two main tributaries of our language, I shall speak of as the Anglo-Saxon and the Classical, and shall endeavour to show that the older, or Anglo-Saxon element, is emphatically that of poetry, as best adapted to the work of addressing the fancy, and appealing to the feelings, while the other is found to be the most suitable in all which concerns the peculiar province of the intellect. And the reason is this:—like the feelings themselves, the language of feeling never alters. "One touch of nature makes the whole world kin," and while the restless intellect of man is making new discoveries, achieving new conquests, and perpetuating them in the advances of science, and the progress of civilization, the human heart remains still and ever the same. Through every stage of social progress—in the midst of the constant changes and chances of this mortal life, that source of sympathy and fount of feeling remains unchanged; and the language which is the exponent of those feelings partakes of the same unchanging character. But that language which describes events and circumstances—which records the discoveries of science, and conveys the lessons of philosophy, must be expected to change its form, and to enlarge its scope, as new events transpire, and circumstances alter, and science achieves new triumphs, and philosophy extends her researches, and gathers from each new field of observation new motives to duty, and fresh supplies of deep and solid wisdom. Poetry, again, has to do with details; science with generalisations. For the former, simple words, expressive of simple ideas, are necessary, and such are most commonly of Anglo-Saxon derivation. For the latter, such words are needed as are capable of combination—as the Latin and Greek—by which complicated ideas may be united in a single word, at once significant and concise. For these two distinct purposes, the two main branches of our language seem signally fitted, and I hold very strongly the opinion, upon grounds to be shewn presently, that any heedless or ignorant admixture of the two, without reference to this principle, tends to lower the purity, and weaken the force of language, and to lessen the peculiar charms of its respective constituents.

No stronger proofs could be adduced than those which are to be found in the Sacred Writings. But these I forbear to press into a discussion upon a purely literary topic, though I cannot pass without naming Psalms CIV. and CXXXIX., Eccles. XII., Isaiah XL.; the history of Joseph, the appeal of Ruth, and that night vision in the book of Job which Burke refers to, as a

passage of "amazing sublimity."* In the Lord's Prayer, too—as we learned it from beloved lips in infancy—there are not six words, which are not immediately and directly derivable from Anglo-Saxon. The Prayer Book of the Church of England bears also similar testimony. Those parts of it which have been added, on occasion, and to meet particular contingencies, may almost in every case be distinguished from its original contents, by the more extensive prevalence in them of a foreign classical diction. Theology requires such a diction, but Devotion does not. What, I would ask, has that noblest of all hymns—the Te Deum—or that most devout of all supplications—the Litany—lost of original significance and force in that Anglo-Saxon version with which we are so familiar?

But we will turn from these examples to the illustrious roll of English poets; and by the light of their undimmed and still unwaning lustre, examine the theory which I have to vindicate. Wordsworth remarks that "the affecting parts of Chaucer are almost always expressed in language pure and universally intelligible, even to this day."† The same cannot be said of his descriptions of persons and customs; and the reason why the language proper to feelings has remained unaltered, while that which is appropriate to other matters has changed, has already been given. Sir Philip Sidney said of the old ballad of Chevy Chase, "that he never heard it, that he found not his heart moved by it more than with a trumpet."‡

Campbell tells us, however,§ that "the prevailing fault of English diction, in the fifteenth century, is redundant ornament, and an affectation of Anglicising Latin words." Nor can we wonder at this, when we remember of how many co-operating causes it was the effect. The Crusades, and the extended commerce to which they led, had opened the civilisation of the East, to the semi-barbarism of the West. During the long period in which the Turks threatened Constantinople, there was a constant influx of the learned of that metropolis into Italy, where the love of ancient learning revived under their auspices; and when at last, A. D. 1453, the imperial capital of the East fell into the hands of the Mahomedan conquerors, the treasures of literature, which had so long been accumulated there, were dispersed throughout Christendom, and the invention of printing soon

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* On the Sublime and Beautiful, Part II., Section iv.
† Note to Preface, *Lyrical Ballads*.
‡ *Defence of Poetry*, quoted in Percy's Reliques, vol. i.
§ Essay on English Poetry, p. 93.

placed them within the reach of the studious in every country. Nine new colleges had been founded at Oxford, and an equal number at Cambridge, in the course of the thirteenth and fourteenth centuries; the same period also witnessing the establishment of the foreign universities of Padua, Naples, Toulouse, Montpelier, Salamanca, Orleans, and some others of less note. In the two succeeding centuries, the movement not only continued, but was urged on by the circumstances just mentioned. And it was then, too, that our Grammar Schools sprang into existence. That of St. Paul's, London, was founded by Dean Colet, the friend of Erasmus, in 1510; that of Manchester, by a Lancashire worthy, Hugh Oldham, bishop of Exeter, in the same year;* and during the reigns of Henry VIII., Edward VI., and Elizabeth, 1509–1603, a very large proportion of those now in existence were established, some by the sovereign, others by private individuals. Among the former are the Westminster, Shrewsbury and Birmingham Schools, and Christ's Hospital; and among the latter, besides the foundations of Colet and Bishop Oldham, just mentioned, the noble schools of Harrow and Rugby, and that of Merchant Taylors' Company, in London, as well as others in the smaller towns throughout the kingdom, almost every one of which has, at some time or other, sent forth its pupil into the world, to play therein an honourable part, and to become thereafter one of the nation's illustrious ones. Bishops and priests, soldiers and statesmen, philosophers and poets: men whose names are watchwords, breathing

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* The Boteler Grammar School, at Warrington, was one of the earliest of these Foundations, having been established in 1526. See the paper by J. F. Marsh, Esq., in the present volume. The total number of Grammar Schools in England and Wales, appears by the reports of the Charity Commissioners to be 705, and their total annual income £167,761. The following table taken from the "*Digest of Schools and Charities for Education*," which forms part of the Commissioners' Report, shews the number of Grammar Schools founded in successive reigns.—It is extracted from the *Educational Expositor* for November, 1855:—

Henry II (1154–1189) 1	Elizabeth (1558–1603) 112	Anne 29
Richard II (1377–1399) 2	James I (1603–1625) 70	George I (1714–1727) 39
Henry VI (1422–1461) 3	Charles I (1625–1649) 54	George II (1727–1760) 26
Henry VII (1485–1509) 7	Commonwealth (1649–1660) 33	George III (1760–1820) 22
Henry VIII (1509–1547) 36	Charles II (1660–1685) 65	George IV (1820–1830) 1
Edward VI (1547–1553) 48	James II (1685–1689) 15	Unknown 97
Mary (1553–1558) 22	William and Mary (1689–1702) .. 23	Total 705

courage into the breast of the hero, and inspiration into the spirit of the sage; these were once the hard-working pupils of England's Grammar Schools. Not to wander from our present subject, just glance at the list of poets. From Westminster School have come Ben Jonson and Dryden, Cowley and Cowper, Churchill and Southey. Milton was educated at St. Paul's; his witty contemporary, the author of *Hudibras*, at Worcester;* Shakspeare at Stratford; Sir Philip Sidney at Shrewsbury; Addison, Dr. Johnson, and Garrick, at Lichfield; Coleridge and Charles Lamb at Christ's Hospital: and Wordsworth received a portion of his early training at the little village Grammar School of Hawkshead, in this county. And now, to connect this apparent digression with our present subject.

The object of these schools was to give a classical education: to make that general which Henry VIII. had already made fashionable, by his own attainments, and by having his children thoroughly instructed in the ancient languages. Sir John Cheke, Regius Professor of Greek at Cambridge, had been Preceptor to King Edward, and Roger Ascham to Queen Elizabeth. If, therefore, the prevailing fault of the fifteenth century was, as Campbell states, the affectation of Anglicising Latin words, such a fault was not likely to be amended in the following century. That, on the contrary, it greatly increased, we know to be historically true. A well-known testimony is borne to this fact by the very competent authority of Sir Walter Scott, who, in his novel of the *Monastery*, avowedly satirizes, in the character of Sir Piercy Shafton, the current language of fashionable life in the time of Queen Elizabeth. Yet the reign of that sovereign stands pre-eminently illustrious in the annals of English poetry; and the two greatest names in the splendid array of Elizabethan poets are those of men who may be said to have absolutely turned their backs upon the fountains of classic lore, and drawn only from the "well of English undefiled." That Shakspeare brought with him from the Grammar School at Stratford "little Latin and less Greek,"† is no unfortunate circumstance for the English language, and for English poetry; and that Spenser, after once contemplating so great an innovation as the abolition of rhymes, and the introduction of hexameters into English verse, should finally not only adopt Anglo-Saxon as the vehicle of his thoughts, but should avowedly imitate the diction of times preceding his own, shews that he, too, turned away from the new wine which he had

* *Comus* was first acted, and *Hudibras* was written, at Ludlow Castle.
† Ben Jonson.

more than tasted, "saying the old is better." And what was thus effected for the diction of poetry, by the genius and example of these two great men, was yet more remarkably and successfully accomplished for the language itself by our noble English Bible. That which was solid and fixed in the character of our vernacular was thus taken from the lips of the people, and imperishably recorded; and much besides, which was in a state of transition, and might soon have become obsolete, was arrested, and thus saved from being swept away before the invasion of a new and pedantic phraseology. It was as if,—to borrow an illustration from that beautiful art, of recent discovery, which transfers and embodies into picture not only the bold, immutable outlines of the landscape, but seizes too its lighter graces, and catches the very shadows as they fly,—thus it was that Tyndale and Coverdale first of all, and the translators of our present version after them, not only employed and recorded in permanent shape that part of our language which was in daily use, but those more fleeting characteristics which are analogous to the passing shadows in the view, or the momentary play and expression of the features,—all these were seized in their passage, and written in light, as with a ray from heaven, and the result was that glorious picture, our peerless English Bible. If any man would see what poetry is, and what it is not, and would judge of the capability of our Anglo-Saxon tongue, let him turn from a passage in Dr. Johnson, Young, Akenside, or Thomson, or in the works of some who might be named among our living authors, to a chapter in Isaiah, or to one of the Psalms. There he will see how the sublimest truths which can address man's intellect, and the most touching incidents which can affect his heart, are set forth in the plainest and simplest language. They seek no embellishment from words; the stirring grandeur, or the moving pathos of the subject, appears all the more vividly for the pure simplicity of its vesture.

But now to turn to those illustrations which these observations have too long interrupted. We will first quote Spenser—that "prince of poets in his tyme"—and it should be sufficient to refer to his description of the "gentle Una with her milk white lamb," in the first Canto of his *Faery Queene*, and again to that passage in Canto III., where it is said—

> Her *angel's face*
> As the great eye of heaven shyned bright,
> And made a sunshine in the shady place,
> Did never *mortal* eye behold such heavenly *grace*.

Out of nearly thirty words in this passage, there are just four of foreign

derivation; and not to dwell too long upon a single work, or a single author, I will just quote two of the stanzas in the same writer's exquisite *Hymn of Heavenly Love.*

Yet, O most blessed spirit! pure lampe of light,
Eternall spring of grace and wisedom trew,
Vouchsafe to shed into my barren spright
Some little drop of thy celestiall dew,
That may my rymes with sweet infuse imbrew,
And give me words equall unto my thought,
To tell the marveiles by thy mercie wrought.

O blessed Well of Love! O Floure of Grace!
O glorious Morning Starre! O Lampe of Light!
Most lively image of thy Father's face.
Eternal King of Glorie, Lord of Might,
Meeke Lambe of God, before all worlds behight,
How can we thee requite for all this good?
Or what can prize that thy most precious blood?

A close examination of these passages will shew how little the author owes to a classic diction; how capable he proved the older English tongue to be, as an exponent of devotional and poetic thought. Turn now to Shakspeare, and see if it was necessary to the expression of his vivid thoughts, that he should escape from the poverty of his native language, and become a dependant upon the wealth of other tongues. Our examples, however, must be short and few. First glance at the night scene in the *Merchant of Venice*:—

How sweet the moonlight sleeps upon this bank—
Here will we sit, and let the sounds of music
Creep in our ears: soft stillness and the night
Become the touches of sweet harmony.

Again in *Henry VI.*:—

The gaudy, blabbing, and remorseful day
Is crept into the bosom of the sea.

And the description of the River, in the *Two Gentlemen of Verona*:—

The current, that with gentle murmur glides,
Thou knowest, being stopped, impatiently doth rage;
But when his fair course is not hindered
He makes sweet music with the enamel'd stones,
Giving a gentle kiss to every sedge
He overtaketh in his pilgrimage;
And so by many a winding nook he strays,
With willing sport to the wild ocean.

Besides these, which seem sufficient for the purpose, I had marked for quotation the apostrophe to Mercy, in the *Merchant of Venice*, Wolsey's Farewell to Power and Dignity, the passage in *Macbeth*, beginning—

"To-morrow, and to-morrow, and to-morrow,"

with some others. But time prevents my quoting them at length, or making comments as I proceed. A close observation of the passages read will shew that the diction is that which I have called Anglo-Saxon, to the almost entire exclusion of those words which are of classical derivation.

Milton, though so eminent a classic, and though *Paradise Lost* was formed upon the best ancient models, and his declared purpose was to make an innovation upon English practice, by setting an example,—"the first," he says, "in English,—of ancient liberty recovered to Heroick Poem, from the troublesome and modern bondage of Rhyming,"* has yet clothed some of his finest thoughts in that native language, which was the theme of one of his earliest poems. The description of Evening in the Fourth Book of Paradise Lost—

"Now came still evening on," &c.

and that exquisite speech of Eve's which follows it—

"With thee conversing, I forget all time," &c.

are strongly illustrative of the point we are arguing. So also is the opening speech in *Samson Agonistes*, on his blindness; in contrast to which might well be placed the opening of Book III., in Paradise Lost, beginning, "Hail, holy light," which, with the exception of a few occasional lines, seems to be at once the least poetical and the least intelligible passage in the poem; and that simply from its faulty diction. The Song on May Morning, *Comus*, and the smaller poems, would furnish us with corroborative examples in abundance. Milton was the contemporary of the metaphysical poets; and early in his career seems to have been ambitious of a place amongst them. That despicable school was the product of the extension of classical learning which followed the Reformation, and of the access thereby given to the metaphysical disquisitions of the schoolmen of the middle ages. It would be hard to find, anywhere, more of the common-place and the nonsensical in the garb of verse, than in works of this class; yet some of those writers had a relish for true poetry, and have left behind them some evidences of their powers "not utterly unworthy to endure." Here is a specimen from Francis Quarles, in simple native English :—

Can he be *fair*, that withers at a blast?
Or he be *strong*, that airy breath can cast?
Can he be *wise*, that knows not how to live?
Or he be *rich*, that nothing hath to give?
Can he be *young*, that's feeble, weak and wan?
So *fair*, *strong*, *wise*, so *rich*, so *young* is Man.

* Preface on "The Verse."

So fair is Man, that Death (a parting blast)
Blasts his fair flower, and makes him *Earth* at last;
So strong is Man, that with a gasping breath,
He totters and bequeaths his strength to Death;
So wise is Man, that if with Death he strive,
His wisdom cannot teach him how to live;
So rich is Man, that (all his debts being paid)
His wealth's the winding sheet wherein he's laid;
So young is Man, that (broke with care and sorrow)
He's old enough to-day, to die to-morrow;
Why bragg'st thou then, thou worm of five feet long,
Th' art neither fair, nor strong, nor wise, nor rich, nor young.

The seventeenth century produced a noble array of philosophers—but few poets. In the next generation, the attempt was made to unite the pursuits of both, and that School of Philosophical Poetry sprang up, of which Pope was the founder, and the *Essay on Man* the chief result. This influence continued to operate, with slight modifications, until nearly the commencement of the present century. Wordsworth then set himself to conquer it, but for the time he was foiled. To him, however, and to his friends, Coleridge, Southey, and Scott, do we owe, in a great measure, the increased use which the simple and expressive language of our Anglo-Saxon forefathers has gained in current speech and writing. Take the very first poem in the works of the Poet-Sage of Rydal:—

My heart leaps up when I behold
A rainbow in the sky;
So was it when my life began;
So is it now I am a man;
So be it when I shall grow old,
Or let me die!
The Child is father of the Man,
And I could wish my days to be
Bound each to each by natural piety.

The two last words are derived from the Latin, but there is not another in the whole poem which is not Anglo-Saxon.

Then there is the affecting little story, "We are Seven," the Sonnet on "Milton," and that composed on Westminster Bridge:—

Earth has not anything to show more fair:
Dull would he be of soul who could pass by
A sight so touching in its majesty:
The city now doth like a garment wear
The beauty of the morning: silent, bare—
Ships, towers, domes, theatres, and temples lie
Open unto the fields, and to the sky,
All bright and glittering in the smokeless air.
Never did sun more beautifully steep
In his first splendour, valley, rock, or hill;
Ne'er saw I, never felt, a calm so deep!
The river glideth at his own sweet will;
Dear God! the very houses seem asleep;
And all that mighty heart is lying still.

It will be observed here that most of the natural objects have vernacular names, while those which are artificial have classical ones. I shall only add one more extract from Wordsworth—the description of the *White Doe of Rylstone*:—

White she is as lily of June,
And beauteous as the silver moon,
When out of sight the clouds are driven,
And she is left alone in heaven;
Or like a ship some gentle day,
In sunshine sailing far away;
A glittering ship that hath the plain
Of ocean for her own domain.

A similar passage from Dryden, from the opening of the *Hind and the Panther*, I will here cite, though out of chronological order. Dryden was the lineal predecessor of Pope: like him, he was the poet of artificial life rather than of nature, and his testimony is therefore the more valuable:—

A milk-white Hind, immortal and unchang'd,
Fed on the lawns, and in the forest rang'd;
Without unspotted, innocent within,
She feared no danger, for she knew no sin.
Yet had she oft been chas'd with horns and hounds,
And Scythian shafts; and many winged wounds
Aimed at her heart; was often forc'd to fly,
And doomed to death, though fated not to die.

Though there are several words of Latin derivation in this quotation, they bear a very small proportion to the whole, and there is nothing in Dryden which breathes a finer strain of pure and simple poetry. If we had time to examine the works of other writers belonging to the same school—Gray, Collins, Goldsmith, Cowper—we should find ample evidence to the same purpose. But we must return to the contemporaries of Wordsworth. Coleridge somewhere defends himself against the supposition that he was a full believer in the poetical creed of his friend; but along with other benefits which he wrought, he certainly helped, by his example, in a very eminent degree, to purify our poetry from the jargon of the philosophico-poetic school. I will first quote from the *Ancient Mariner*:—

To walk together to the kirk,
And all together pray,
While each to his great Father bends,
Old men, and babes, and loving friends,
And youths and maidens gay!
* * *
He prayeth best, who loveth best,
All things both great and small;
For, the dear God that loveth us,
He made and loveth all.
* * *

He went like one that hath been stunned,
And is of sense forlorn :
A sadder and a wiser man,
He rose the morrow morn.

For all the purposes of this passage, any other tongue than the Saxon might almost as well have never existed ; and so in *Christabel* :—

The night is chill ; the forest bare ;
Is it the wind that moaneth bleak ?
There is not wind enough in the air
To move away the ringlet curl
From the lovely lady's cheek ;
There is not wind enough to twirl
The one red leaf, the last of its clan,
That dances as often as dance it can,
Hanging so light, and hanging so high,
On the topmost twig that looks up at the sky.

And the exquisite ballad of *Genevieve* gives further testimony of the same kind. But it may be thought that though our primitive language is adequate to the expression of simple ideas, and to the happy description of natural objects, it is wanting in force, and would fail to express strong emotions, or to develope nobler images. There are numerous passages in Coleridge which would prove the contrary ; but I prefer to take an example from a very different author, and one who, it might be thought, would rather militate against the theory I am advocating. If any man ever ignored the canons of the critic, and wrote because he had something to say, and must say it, it was Byron. Let him then be witness. With his wild passions boiling within him, all he cared to do was to give utterance to his strong feelings, in language as strong and vivid as themselves. And he succeeded. No man's works reflect more faithfully than his, their writer's true character, or express with greater power, the bitterness, the hatred, the scorn, which flamed up incessantly and inexhaustibly from the volcano of that impetuous heart. And what was the language which came ready to his pen, when he wielded it to defy the world ? Why, the simple Saxon phrase of our unconquered forefathers. When, before he closes *Childe Harold*, his voice "breaks forth" to "pile on human heads the mountain of his curse," what says he—and how ?—"That curse shall be forgiveness," &c. (See Childe Harold, Canto iv., Stanzas cxxxv., cxxxvi.) So, too, the description of the night before Waterloo, at Brussels ; the Apostrophe to the Ocean, in the same poem ; the opening lines in the *Corsair* ; the Shipwreck, in *Don Juan*— "Then rose from sea to sky the wild farewell ;" and, last of all, that wonderful passage in the *Giaour*,

wherein the aspect of "Greece, but living Greece no more," is compared to the appearance of the dead upon the day of dissolution—

> The first dark day of nothingness;
> The last of danger and distress;
> Before Decay's effacing fingers
> Have swept the lines where Beauty lingers.

Time fails to refer to Scott or Southey, to Shelley, or the poets of our own day. I will just, however, allude to one striking fact. The shorter poems, which are the most popular things of the kind in our language, and by which their authors have attained to the widest celebrity and most enduring fame, are those in which the old Saxon diction has been employed. Of this class are Gray's Elegy; Wolfe's Ode on the Burial of Sir John Moore; Campbell's Hohenlinden; Hood's Song of the Shirt; Tennyson's May Queen; together with some of the more popular pieces in Longfellow, and in Moore's Irish Melodies, and those exquisite descriptions in Goldsmith's Deserted Village, which every schoolboy, in every subsequent generation, has known off by heart. Burns, too, wrote in a language which was oral: not a written language at all: a dialect of that Anglo-Saxon tongue which is common to ourselves, and to our fellow-countrymen in the vast colonial dependencies of the empire, as well as to that sister nation across the Atlantic, where, as I have been informed on good authority, next to the Bible, the most popular, and familiar, and best read book in the country, is the poetry of Robert Burns.

Having thus gone through the works of the greatest English poets, from the Elizabethan era downwards, I submit that I have proved my case—that the Saxon element in our language is the most fitting dress of poetic thought,* and that it has been so employed to embody the noblest concep-

* And this, after all, is but the local application of a general principle. Mr. J. T. Danson, one of the Vice-Presidents of the Society, who occupied the Chair when the present paper was read, threw out this, among other valuable suggestions and remarks, and pointed out, that what is here claimed for what I have called the Anglo-Saxon portion of our language, is probably "possessed, in an equal degree, by the most commonly used part of every other language, when used with ability in addressing those to whom it is native." It is evident that the argument in the paper derives great force from this fact; and that the subject acquires new interest when it is seen that a general principle is illustrated by what was intended to have only a local application. I will put the question thus:—1. The primitive oral language of every people, as it embraces the widest range of associations, is the language of that people's poetry. 2. The Anglo-Saxon is the primitive oral language of the English people; and therefore, 3. The Anglo-Saxon is the appropriate diction of English poetry. Nor have I, in that over-zealous advocacy, which some may think they recognise, claimed more for our primitive Saxon tongue than has been claimed for it by others, whose eminence as writers, and weight as literary authorities, will be recognised when I quote Mr. Macaulay:—"The style of Bunyan," says that

tions, by those among our countrymen, whom all delight to honour. And the practical conclusion to be drawn from such an enquiry as the present is this—that whoever aims at poetic excellence, must study attentively the primitive language of this country, must learn to estimate its richness, to appreciate its beauty, and strive to make it the vehicle of communicating his thoughts to those whom he would address. It will more completely and clearly convey his own meaning; it will permit a fuller measure of justice to the nature of his conceptions, and obtain for them a readier comprehension and appreciation from the reader. Surely these are advantages not to be slighted. Those who have laboured to possess them, have been rewarded by the veneration of posterity; while those who have affected to despise, or neglected to cultivate, our simple but earnest Saxon phraseology, though they have, in some instances, achieved a "bubble reputation" in their lives, have been contemptuously doomed to the indifference of later times. Such has been their ultimate gain, after having chosen to adopt a gaudy and "inane phraseology," which has passed current under the name of poetic diction. That spell, however, has been broken. Many of our best modern writers, following Wordsworth's illustrious example, have aimed at, and apparently succeeded in, establishing the principle, that such words as the influence of classical studies have now naturalised into our language, may be legitimately employed, if used discreetly and appropriately, always subject to the laws of rhythm, and subordinate to the more copious use of those primitive words which form the great bulk of our vocabulary, and to which we mainly owe it that our noble English tongue is so rich, so flexible, so expressive, and so musical,

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brilliant writer, "is delightful to every reader; and invaluable as a study to every person who wishes to obtain a wide command over the English language. The vocabulary is the vocabulary of the common people. There is not an expression, if we except a few technical terms of Theology, which would puzzle the rudest peasant. We have observed several pages which do not contain a single word of more than two syllables. Yet no writer has said more exactly what he meant to say. For magnificence, for pathos, for vehement exhortation, for subtle disquisition, for every purpose of the poet, the orator, and the divine, this homely dialect, the dialect of plain working men, was perfectly sufficient. There is no book in our literature, on which we would so readily stake the fame of our old unpolluted English language; no book that shews so well how rich that language is in its own proper wealth, and how little it has been improved by all that it has borrowed." (*Essays*, vol. i.) And that which is here said of Bunyan, might be applied with almost equal force to Defoe. Indeed, it would be possible to carry the argument much further than I have done, and to maintain upon very strong grounds, that not only the most popular *poems*, but the most popular *books*, in our language, are those in which the primitive speech of the people has been used by a master hand.

as the authors now quoted have, in their undying works, demonstrated it to be. Any broad impassable line of separation between the two elements in our language which have now been dwelt upon, I fear too tediously, is as impracticable as it would be absurd. To interweave the one with the other; to give to poetic thought its best expression in the fittest words; scouting equally the affectation of a mawkish simplicity, or the assumption of a pompous volubility—this is the most worthy of the poet's honoured name, and of his noble vocation; as it is the most likely to make his calling honoured, and to establish his own fame upon a real and permanent foundation. But simplicity is a different thing from common-place; and doggrel is not poetry. The poet must treat of objects, not as they are (begging pardon of the Pre-Raphaelites), but as they seem to be. And poetic effect depends not exclusively upon the nature of his subject, but also upon a writer's treatment of it—at least to the same extent that artistic effect depends upon the painter. He finds the best point of view; depicts the scene before him with due regard to the finest effect of light and shade, and expressive grouping; and so he produces an admirable picture. Yet over the very same scenes the "ploughman plods his weary way" daily, but is as indifferent to their beauties as if they had no existence, or as if he were the inhabitant of another planet. And as with the artist's, so with the poet's eye. In the "primrose by the river's brim," and in "the meanest flower that blows," he sees something more than the outward shape, and visible colouring. While for these he has a more intense and loving admiration than another, his fancy invests them with new life and loveliness, "finds tongues" in their speechless beauty, surrounds them with touching images or kindling associations of magnificence and grace; and so by the matchless magic of the poet's pen, he wings their tender messages or thrilling appeals to every heart, which has kindred sympathies with his own.

ON THE FOUNDATION AND HISTORY OF BOTELER'S FREE GRAMMAR SCHOOL AT WARRINGTON.

By John Fitchett Marsh, Esq.

(Read 7th February, 1856.)

After one of our meetings, at which mention had incidentally been made of the Grammar School established at Warrington in 1526, I was requested to make it the subject of a paper; and I promised to put into such a form as might be suitable for a page of our transactions some notes which I have from time to time collected, on the names of the various persons whom I have been able to trace as having filled the office of schoolmaster. It afterwards appeared to me that an account of the foundation deed and a sketch of the history of the school might not be without interest, not only with reference to the particular institution, as a subject of local history, peculiarly within the province of this society, but as illustrative of the state of manners and opinion at that remarkable era in our literary and religious history, of which the foundation of grammar schools was a striking characteristic.

A large proportion of these schools owed their foundation to charters from King Edward VI. and Queen Elizabeth, granting to them the endowments of chauntries, suppressed under the statute 1 Edward VI. c. 14, which, after reciting that "a great part of superstitions and errors in Christian religion hath been brought into the minds and estimations of men, by reason of their ignorance of their very true and perfect salvation through the death of Jesus Christ, and by devizing and fantazying vain opinions of purgatory and masses satisfactory, to be done for them which be departed, the which doctrine and vain opinion by nothing more is maintained and upholden than by the abuse of trentals, chauntries, and other provisions made for the continuance of the said blindness and ignorance, and further considering that the alteration, change, and amendment of the same, and converting to good and godly uses, as in *erecting of grammar schools to the education of youth in virtue and godliness*, and the further augmenting the universities, and better provision for the poor and needy, cannot in this present parliament be provided and conveniently done," authorises the

seizure to the king's use of all lands and possessions for the maintenance of chauntry priests, and the payment into the exchequer of rent-charges appropriated to superstitious uses. But the endowment of schools for the cultivation of classical learning had a prior and independent origin. For some years before the altered relations of the Defender of the Faith with the Court of Rome led to the dissolution of the monasteries, the monastic system had been tottering to its fall: and the exposure of its corruption had prepared the public mind for a measure so violent, that even Henry would not have ventured on it, if he had not felt confident that his designs were seconded by the national will. In the meantime, the revival of classical learning on the continent, and the general enfranchisement of the human mind, which accompanied the agitation of the questions raised by the early reformers, awakened many, even among those who had seen no reason to abandon their allegiance to the Romish church, to the necessity for providing those means for the advancement of learning which the monasteries had ceased to afford. Thus about the year 1515, we find Richard Fox, Bishop of Lincoln, whose foundation of Corpus Christi College at Oxford was originally intended for a monastic establishment, diverted from his purpose by the remonstrance of Hugh Oldham, Bishop of Exeter (himself the founder of the Manchester Grammar School in 1510) urging him to provide for the increase of learning rather than "build houses and provide livelihoods for a company of bussing monks, whose end and fall they themselves might live to see." (*Holinshed's Chronicle*, iii. 617, ed. 1808.) In the same spirit colleges and schools were about this time founded in considerable numbers by royal and individual liberality. Of those which are referred to the former source it is perhaps unnecessary to enquire how many are really indebted to royal munificence, and how many owe nothing to the monarchs whose names they bear, beyond the trouble of affixing the sign manual to the warrant for issuing a charter.

Our Warrington Grammar School owes neither lands nor charter to royal favor; but is indebted for its foundation to the pious bounty of Sir Thomas Boteler of Bewsey, one of the heroes of Flodden, whose knightly family, as lords of Warrington from a period very shortly after the conquest, have been more than once mentioned in the transactions of this society. By his will, dated 16th August, 12 Henry VIII. (1520), after reciting that he had "delyvit by indenture tripartede into the custody and kepyng of the righte revende Father in God John Abbotte of Whalley fyve hundrethe markes

in golde savely to be kepte to his use and to be disposede at his pleasure," declares that "it is his full will and mynde that his executors should have the disposicon and orderyng of the said sume of fyve hundrethe markes to purchase and obteyne lands tents or rentes to the yerely value of ten pounds above all charges or as myche thereof as should be unprovidett and purchasede by him and therewith to found a fre gram scole in Weryngton to endure for ev and to susteyne and beire the charges of the same and the residue of the saide fyve hundreth markes whiche should remayne aft the said land p,chasede and all costes and charges consnyng the said fundacon of the saide gram scole made & hade he willed that his executors should have the disposicon thereof to dispose for his soule and his wyffe's soule and for the maynetnnce of that his p'sente testamente And it was his will that his executors duryng theire sevall lyves and aft theire decease that his heires from tyme to tyme should denoiate name and appoynte an honeste preste groundely lernede in gram to be maist of the said scole whiche should say masse pray and do dyvine s'vice at the poche churche of Weryngton for the soule of him the saide Sir Thomas Dame Margarette his wyffe his auncetors and his heires after theire deceases and that all statuts and ordinnces concernyng the fundacon of the saide scole should be made and stablysshede by him and his said executors."

Sir Thomas set about the good work in his life time; for by a codicil, dated 27th February, 13 Henry VIII. (1522), after reciting that "his trusty srvnts S^r^ Will^m^ Plutre and Rauf Alyn at his costs and charges to his use & to the p'fomace of his last will had p'chased certen mesis lands and tents in Tyldesley and Weryngton," he willed "that the said feoffees should stand seasyd of all the said mesis lands & tents w^t^ all their apptnnce to thuse of the fundacon of the free gram scole as is compset in his said will and the same mesis lands and tents to be made sure to the same use by thadvise of his executors and their councell lerned."

He died on the 27th April, 1522; and his pious intentions were carried into effect by an indenture dated the 16th April, 1526, to which date I have accordingly referred the foundation of the school. The deed is made between Thomas Boteler, Esquire, son and heir of Sir Thomas Boteler, of the first part, Dame Margret Boteler, late wife of y^e^ s^d^ Sir Thom, Ranulph Pole Clerke, Rich^d^ Sneyde Esq., & Will^m^ Plumtre Chapleyn, Executors* of

* A few words on the names of the executors may not be out of place. Dame Margaret, the testator's widow, was the daughter of John Delves, of Doddington, and is

the testament and last will of y^e^ s^d^ S^r^ Tho. Boteler of the second part, Sir Richard Bolde K^t^ and 15 other knights, esquires, & gentlemen, four of whom had married daughters of the testator, the intended trustees (or feoffees as they were then styled) of the third part, and S^r^* Richard Taylor, clerk, named deputed & ordained schoolm^r^ of A new Free School made & ordained

said to have subsequently married Richard Butler, of Rawcliffe. Ranulph Pole is described in the attestation to the will as Parson of Hawardyn. Richard Sneyd, was recorder of Chester, and four times chosen member of Parliament for that city. In 19 Henry VIII. he purchased from John Cheney the manor of Wistaston, which has descended to the Sneyds of Bradwell and Keele, in the county of Stafford. (See *Orm. Chesh.* iii. 256.) Sir Thomas Boteler, who by his will confirms a fee or annual rent of twenty shillynge by the yere to his trusty frende Richard Sneyde for his counsel to him given, appears to have selected him with a view to his professional knowledge, as one of the executors, which office he also filled to Thomas, second Earl of Derby, who died 24th May, 13 Henry VIII. (See *Seacombe's House of Stanley*, p. 43.) The name of William Plumtre occurs in various documents of the period. Sir Thomas, by his will, directs certain feoffees, in whom he had already vested the advowson of the parish church of Warrington for that purpose, to "p̄sente to be p̄sone of the said churche when it shall happe to be next void my well-beloved chapleyne Sir William Plumtre preste for the gode love zele and favor that I beire to the said Sir William and to thentente that he shall daily pray for me;" and makes a pecuniary provision for him until he should be promoted to some benefice of the yearly value of £20 or above. Notwithstanding the testator charges his son and heir, Thomas Boteler, upon his blessing, to suffer the said Sir William peaceably to be presented and inducted into the said church, it does not seem that the arrangement was ever carried into effect; for it appears from Randle Holme's notes on Warrington Church, printed in *Baines*, from the Harl. MSS., that Richard Delves, parson of the Church, died 22nd November, 1527, and on the 27th September, 35 Henry VIII. (1544), we find Sir William Plumtre in possession of the church of the dissolved Augustine Priory of Warrington, under a lease from the great monastic grantee, Thomas Holcroft, (see *Beamont's Warrington in* 1465, p. xlvi.,) while in the 34 Henry VIII., as I shall have to notice presently, the rectory of Warrington was held by Edward Keble, and an arrangement made which rendered it, for 200 years, of very little value to his successor.

* The use of "Sir," as a clerical title, even down to the time of Shakespeare, is as familiar to the reader of early poetry as to the legal antiquary, who meets with the title so often in formal documents like the present, that he cannot share the evident surprise of Tyrwhitt, in his Glossary to Chaucer, "that it has crept *even* into Acts of Parliament." The precise import of the title has not, however, been much considered. Sir Walter Scott, speaking of the usage in Scotland at the end of the fourteenth century, observes that "all the priests of the period, who were called from that circumstance the Pope's knights, received the honorable title of *Dominus*, contracted into *Dom* or *Dan*, or translated into *Sir*, the title of reverence due to the secular chivalry." (*Fair Maid of Perth*, ch. xx.) Archdeacon Nares, in his *Glossary*, also speaks of it as a title "applied to priests and curates in general," explaining that *Dominus*, the academical title of a bachelor of arts, was usually rendered by *Sir* in English at the Universities, so that a bachelor, who in the books stood '*Dominus Brown*,' was in conversation called '*Sir Brown*.'" He adds, that this was in use in some colleges even in his memory, but not, as in the instances found in Chaucer and Shakespeare, prefixed to the Christian name. Fuller observes that "such priests as have the addition of *Sir* before their Christian name were men not graduated in the university, being in *orders* but not in *degrees*, whilst others, entitled *masters*, had commenced in the *arts*: and generally founders of chauntries preferred priests not beneficed to those places, as best at leisure constantly to attend the same." (*Church History*, b. vi. p. 352.) [Since the foregoing was written, the subject has been discussed in *Notes and Queries*.]

by those presents at Warrington in y^e^ county of Lanc. of y^e^ fourth part. It commences with a recital that "y^e^ afores^d^ S^r^ Thomas Boteler k^t^ Right virtuously calling to his good remembrance y^t^ in y^e^ s^d^ county & shire of Lanc. be very few schools of Gram^r^ Whereby mens sons might learn gram^r^ to y^e^ Intent y^t^ they thereby might y^e^ better learn to know Allmighty G^d^ & to serve him according to y^r^ Duties by Virtue wherof they might y^e^ better avoid and eschew all vices & use good man^rs^ thinking also inwardly in his hearte that throw y^e^ Grace & Goodnes of All^ty^ G^d^ many poor child^r^n & yong men applying themselvs to learn gram^r^ w^ch^ is y^e^ originall ground and fountayn out of y^e^ w^ch^ doth proceed & spring y^e^ very mean & plain way to come to y^e^ clear und^r^standing of Good liveing might approach to such knolege of y^e^ light of grace y^t^ pchance they might happen to be y^e^ very clear lanthorn of Good Example in Vertuous living to all y^e^ country thereabouts to y^e^ good encrease and use of vertue and expulsion of all vices fully intended & purposed to have stablished founded and made A free Gram^r^ school in Warringto^n^ afors^d^ if it had pleased All^ty^ G^d^ to have sufferd him to have livd in y^e^ transitorry life few years longer than he did Wherefore & for as much as it pleased All^ty^ G^d^ to take him to his infinite mercy before y^e^ establishm^t^ & Foundat^n^ of y^e^ same Gram^r^ school yet y^e^ s^d^ S^r^ Thomas Boteler by his last will and testam^t^ declared and willed y^t^ y^e^ s^d^ Gram^r^ School sh^d^ be after his Death founded and made for ever to endure Wherefore as well y^e^ s^d^ Thomas Boteler son and Heir of y^e^ s^d^ S^r^ Thomas & y^e^ s^d^ executors of y^e^ Testam^t^ of y^e^ s^d^ S^r^ Thomas as y^e^ s^d^ S^r^ Rich^d^ Bold and other his co-feoffies afores^d^ consid^r^ng y^e^ Blessed mind and Good Purpose of y^e^ s^d^ S^r^ Thom. in y^e^ Premises as is before declared and intending y^e^ perfect execution of y^e^ s^d^ laste will of y^e^ s^d^ S^r^ Thom^s^ and the Accomplishm^t^ of y^e^ same have ordeynd establisht and made & by these Presents done ordeyn establish and make A free Gram^r^ school to be kept and holden for ever in Warrington afores^d^ and also divers convenient ordenances and estatutes concerning y^e^ same as hereafter done ensue."

I will not trouble you with that portion of the deed which relates to the appointment of trustees, the vesting in them of the trust estates, and the provisions for future management, as it is not only comparatively uninteresting, but is accessible in the reports of the Charity Commissioners. It may therefore suffice to say that by the deed under notice, and a deed therein referred to of even date, a house in Warrington, set in a lane there called Baglane, and a croft adjoining, are set apart for the use of the school-

master, to be called the School House of Warrington; and lands in Lancashire and Cheshire, including those specifically mentioned in the codicil, are vested in the feoffees to the use of the schoolmaster. Provisions are also made for the appointment of new trustees, and for granting leases of the lands to the schoolmaster for terms of 60 years determinable with his life; and it is provided that "whensoever y^{e} s^{d} Sir Rich^{d} Taylor now made schoolm^{r} by these presents or any other schoolm^{r} there shall happen to decease or to be amoved from y^{e} mastership or rowme of schoolm^{r} of the s^{d} Free School for any cause hereafter declared that then y^{e} s^{d} Dame Margret Ranulph Rich^{d} & W^{m} Plumtre and y^{e} overliv^{s} of y^{m} shall name and appoint anoth^{r} honest and discreet Priest sufficiently and groundedly learned in gram^{r} & able to teach gram^{r} to be schoolm^{r} of y^{e} s^{d} school for Term of his life & after y^{e} Decease of y^{e} same Dame Margret Ranulph Pole Rich^{d} Sneyde and W^{m} Plumtre that then Thom^{s} Boteler son & heir of y^{e} s^{d} S^{r} Thom^{s} Boteler & his Heirs of his body begotten And for default of Heirs of his Body then his right Heirs from time to time whensoever y^{e} s^{d} school shall happen to fall void of a schoolm^{r} by Death or oth^{r}wise shall name appoint & put in another honest & Discreet Priest groundedly seen & learnd in gram^{r} & able to teach gram^{r} to be schoolm^{r} of y^{e} s^{d} Free school And if it happen y^{e} s^{d} Thom^{s} Boteler or his Heirs of his Body & for lack of Heirs of his Body his right Heirs within A month next after y^{e} Advoidance of y^{e} s^{d} schoolm^{r} to be neglig^{t} & remiss & do not name appoint & put in another schoolm^{r} when & as often as y^{e} s^{d} Free school shall fall void as is before declar'd that then y^{e} Parson of Warrington afores^{d} for y^{e} time being and his Success^{rs} Parsons of Warrington afores^{d} shall have for that time only y^{e} nomination & putting in of A new schoolm^{r} of y^{e} s^{d} Gram^{r} School as often as y^{e} same Free School shall fall void as is afores^{d} & in case y^{e} s^{d} Parson or any his success^{rs} Parsons of Warrington afores^{d} shall happen to be negligent & remiss & do not name nor put in an able Honest and Discreet Priest as is afores^{d} to be schoolm^{r} of the s^{d} Free School by y^{e} space of anoth^{r} month then next following that then the Warden of y^{e} Colledg of Manchest^{r} & his success^{rs} for y^{e} time being shall name & appoint A schoolm^{r} of y^{e} s^{d} Free School in like form as y^{e} s^{d} Parson should have done & in likewise in y^{e} time of y^{e} Vacation of y^{e} s^{d} Parsonage y^{e} s^{d} Warden and his success^{rs} shall have y^{e} nomination & appointm^{t} of y^{e} s^{d} schoolm^{r} for that time only as often as y^{e} same school shall fall void y^{e} s^{d} Parsonage then being void of a Parson." It is further provided "y^{t} y^{e} s^{d} schoolm^{r} shall have A seal made & known for y^{e} schoolm^{rs}

Seal of Warrington w^th^ y^e^ wch Seal he shall do and seal all writings y^t^ to him shall appertain in any thing concerning y^e^ s^d^ school or any thing thereto belonging & y same Seal to be surely kept and deliv^r^d from one schoolm^r^ to another as they shall succeed in y^r^ Rowmes and y^t^ all deeds scripts indentures evidences & muniments concerning y^e^ s^d^ lands &c. shall be layd put & deliv^r^d by y^e^ s^d^ schoolm^r^ by indenture Bipartited into y^e^ s^d^ College of Manchester & there to be surely kept and copies thereof to be made & deliv^r^d to y^e^ s^d^ schoolm^r^ & to remain w^th^ him & w^th^ any other schoolm^r^ there & if any of y^e^ s^d^ lands or tenem^ts^ hereafter happen to be in variance or suit in y^e^ Law then y^e^ Warden of y^e^ s^d^ Colledge or his success^r^ for y^e^ defence thereof shall deliver to y^e^ s^d^ schoolm^r^ all such deeds as concerneth y^e^ same lands then being in variance only if need so shall require & after the Determination or appeasing of y^e^ same variance then y^e^ same schoolm^r^ within one month next after shall redeliver all y^e^ same evidence into y^e^ s^d^ College again." Unfortunately all these precautions have been insufficient for their object. Either from the multiplicity of variances and suits in the law, or from other causes, the deeds are no longer to be found in the College of Manchester; and my extracts are taken from ancient copies, which have been admitted as evidence in the Courts. The schoolmaster no longer boasts his official seal; and it is to be feared no impression of it will ever gladden the eyes of Warrington antiquaries.

But the portion of the foundation deed, to which I wish particularly to direct your attention, is that containing "the Statutes and Ordinances of y^e^ s^d^ Free School," and which, so far as they are desirable for our purpose, are as follows :—

"First it is ordeynd y^t^ y^e^ said schoolm^r^ shall teach any scholar coming to y^e^ s^d^ school after Wittington's Gram^r^* & making or after such Form & such

* Fuller notices that "King Henry endeavoured an uniformity of grammar all over his dominions, that so youths, though changing their schoolmasters, might keep their learning. This was performed, and William Lilie's grammar enjoyned universally to be used. A stipend of four pounds a year was allowed the king's printer for printing of it, and it was penall for any publicly to teach any other. Bishop Buckeridge examining a free school in his diocese of Rochester, the scholars were utterly ignorant of Lilie's rules, as used to others, whereat the Bishop exclaimed, 'What! are there puritans also in grammar?'" (*Church History*, b. v. p. 168.) I find no Act of Parliament bearing on the subject, and know not in what form the royal injunction appeared. It was probably after the date of our foundation deed; for though Lilie's "*Brevissima Institutio seu ratio grammatices cognoscendæ*," appeared as early as 1513, his "*Short Introduction of Grammar* GENERALLY TO BE USED" was first printed by Reynold Wolfe, the king's printer, in 1549. This edition is in the Bodleian, but is extremely rare, not being noticed by either Ames, Dibdin, or Lowndes. The 79th canon of 1603 (confirm-

Gramar wch shall be most used to be taught hereafter in Free Gram^{r} schools & y^{e} same to be taught freely & quietly without taking any Reward Stipend or Schole-hire or any other thing by Promise grant or coven^{t} before made any* Feriall day except three Feriall days next before y^{e} Feasts of y^{e} Nativity of our L^{d} G^{d} Easter and Pentecost and other three Feriall days next after y^{e} said Feasts except y^{e} s^{d} schoolmaster shall happen to have any reasonable let or impediment Provided alwais y^{t} it shall be lawfull to y^{e} schoolm^{r} & any other schoolm^{r} for y^{e} time being to take of any Scholar of y^{e} s^{d} school learning gram^{r} four penys by year y^{t} is to say in y^{e} Quarter next after X^{t}mas A Cock peney & in any of y^{e} three other Quart^{rs} in y^{e} year one Potation† Peny & for y^{e} same Potation Penys y^{t} y^{e} s^{d} schoolm^{r} for y^{e} time

ing the injunctions of Edward VI. and Queen Elizabeth, and the canons of 1571) directs that all schoolmasters "shall teach the grammar set forth by king Henry VIII, and continued in the times of Edward VI. and Queen Elizabeth, of noble memory, and none other." (*Gibs. Cod.* 1145.) It is not very clear which of the numerous grammatical works of Robert Whittinton, printed by Wynkin de Worde and Pynson, from 1513 to 1522, is referred to in our foundation deed as Wittington's grammar; but at this period he must have been at the height of his reputation. He is mentioned by Warton (*History of English Poetry*, ii. 130) as being the last person, (though some later instances are mentioned in Churton's lives of Smith and Sutton,) on whom was conferred the Oxford degree in rhetoric, which included versification and grammar, and which eventually led to the title of Poet Laureate. Anthony Wood says he was "the most famous grammarian of his time, and had his head crowned, or his temples adorned, with laurel; at which time, and the time also when that degree was completed, it was allowed to him by the venerable regents that he might wear a hood lined with silk, but not to be used for the future by any body else." (*Fasti Oxon.* vi. 19.) The judgment of his contemporaries was not ratified by posterity. Roger Ascham speaks with contempt of "such beggarly gatherings as Horman, Whittington, and other like vulgars for making of Latin" (*Schoolmaster*, p. 277, edition 1815); and says that "a child will learn of the better of them that which another day, if he be wise and come to judgment, he must be fain to unlearn again." (Id. p. 196.) Fuller compares Whittinton and Lilly to "a verb *defective* and one *perfect* in all the requisites thereof;" though in another place he quaintly admits that "some since have discovered *blasted leaves* in our Lilly."

* Unless the word *any* is here used in the sense of *every*, as it appears to be elsewhere, the sentence is incomplete, and possibly requires the word *notwithstanding* to be supplied. If the former be the correct reading, the word *ferial* is used in the sense of weekday. It was occasionally so used, as in a charter of 1448 quoted in Cowel's *Interpreter* (s. v. Feria), stipulating for the celebration of mass, "per tres dies feriales in capella ellemosinariæ nostræ, et per alios tres dies feriales in capella S. Marie, diebus vero dominicis ubicunque voluerit." The ferial litany is subsequently spoken of in this sense. The word, however, generally implied a festival day of some sort, whence our *fairs*, which in early times were usually held on the wake or festival of the saint to whom the church was dedicated. Perhaps the word had a meaning answering to our modern holiday, rather than to the ancient holy-day, being used, in analogy to the Roman *Feriæ*, to denote those days on which either law, custom, or religion sanctioned a cessation from labour; and a subsequent clause in the deed may have been intended to restrain the too frequent practice of making ferial days an excuse for the interruption of school duties, and to confine the indulgence to the more important festivals or holy days of the church.

† Both of these payments were sanctioned by almost universal custom, but are expressly prohibited in the statutes of the Manchester Grammar School, together with

being shall make A Drinking for all y^e s^d Scholars in any of y^e s^d three Quart^ns in y^e year."

"Also y^t y^e s^d schoolm^r shall give no licence to any scholar of y^e s^d school to play in any feriall day if in y^e week of y^e s^d feriall days shall happen to fall one Holy day & if it be A whole week without any Holy day that then y^e afores^d schoolm^r for y^e time being shall give Licence to y^e s^d Scholars to play on y^e thursday at afternoon only except it be at y^e Request or Desire of A great Worshipf^ll man."

"Item it is ordeynd by y^e s^d Parties y^t y^e s^d schoolm^r for y^e time being & any other Priest Schoolm^r of y^e s^d School being within Warrington Parish afores^d any Sunday and Holy day shall be personally in y^e Quire of y^e Parish Church of Warrington afores^d in his Surplice to help to sing read & say y^e Divine Service according to his Learning & coning Except he have a Reasonable Excuse or Impediment."

"Also it is ordeynd y^t all y^e schollars of y^e s^d Free School being present thrice in y^e week y^t is to say Sunday Wednesday & Friday shall go two & two togeth^re in Processions about or within y^e s^d Church of Warrington Singing y^e Feriall Litany in y^e Feriall day & on y^e Sunday or other Holy days then singing y^e Respondes * or such Service as to that Day then shall appertain & according to y^e Coning of y^e s^d Scholars in Song."

"Also if y^e s^d schoolm^r for y^e time being or any other schoolm^r of y^e s^d Free-School be proved afore y^e Officiall of Chester by four Honest Persons of Warrington y^t he is not Dilig^t in attending or teaching y^e s^d Scholars or else be not honest in his living by Incontinency or Viciousnes or else if he be not Discreet in Correction of y^e s^d scholars that then if y^e s^d schoolm^r do not amend after three monitions to him thereof to be given by him y^t

the Victor Penny—these, with a number of similar perquisites, having become in many instances an excuse for extortion. To modern ideas the barbarous custom of cock-throwing at Shrovetide is scarcely less reconcileable with scholastic discipline than the Drinking prescribed by our foundation deed; but may not the latter have had its origin in a quasi religious observance connected with the founder's anniversary, and traceable to the Jewish funeral feasts? Fuller speaks of a general expense out of lands wherewith every chantry was endowed "for an anniversary potation, founded, as it seems, on Job's words, Job iv., as Bellarmine citeth the chapter without verse:—Panem tuum et vinum tuum super sepulturam justi constitue—put thy bread and thy wine upon the sepulture of the just man—but no such words appear in the place alleged, though some such like are found in the fourth of Tobit, ver. 17." (*Church Hist.* b. vi. p. 352.) In the Book of Ecclesiasticus, ch. xxx. v. 18, we read "Delicates poured upon a mouth shut up are as messes of meat set upon a grave."

* "Responds" were short anthems sung after reading three or four verses of a chapter, after which the chapter proceeded. (*Gibs. Cod.* 298.)

namd & appointed y^e^ same schoolm^r^ if he then be on live & if he be dead then by him y^t^ shall have y^e^ nomination & putting in of y^e^ s^d^ Schoolm^r^ that then y^e^ same person to whom y^e^ next nomination shall belong shall amove the same Schoolm^r^ & provide name & put in another sufficient & able Priest to be Schoolm^r^ of y^e^ s^d^ Free-school for Term of his Life as is Afores^d^."

"Also it is further ordeynd y^t^ he y^e^ s^d^ Schoolm^r^ for y^e^ Time being shall appoint every day one of his scholars learning Gram^r^ of y^e^ two highest Forms in y^e^ school one after another as y^e^ s^d^ scholars shall sitte in order to teach all infants y^t^ shall come to y^e^ s^d^ school to learn y^r^ A. B. C. & Primars & so forth till they be entred into y^e^ Learning of Gram^r^."

"It is also ordeynd y^t^ as well y^e^ s^d^ schoolm^r^ as y^e^ s^d^ scholars of y^e^ s^d^ school inhabited w^thin^ y^e^ Franchises of Warrington afores^d^ between Michaelmas & Easter shall be at y^e^ Parish Church of Warrington betwixt six & seven of y^e^ clock in y^e^ morning & there shall say such Prayers as shall be lymyted & written on A table to be hanged in Boteler's Chappell within y^e^ s^d^ Church then imediately after y^t^ they shall go to y^e^ s^d^ School-house & shall depart thence at five of y^e^ clock in y^e^ Afternoon or by four at y^e^ Discretion of y^e^ s^d^ schoolm^r^ & between Easter and Michaelmas y^e^ same m^r^ and scholars shall be at y^e^ s^d^ Church between five & six of y^e^ clock in y^e^ morning & there shall say y^e^ s^d^ prayers & then imediately from thence shall depart & go to y^e^ s^d^ school & every night after they shall depart from y^e^ s^d^ school y^e^ s^d^ M^r^ & Scholars shall resort to y^e^ s^d^ Church and there shall sing an Antiphone of our Lady and say such Prayers as shall be expressed in y^e^ s^d^ Table & then depart home."

"Also it is ordeynd y^t^ if any of the s^d^ schoolm^rs^ for y^e^ time being shall happen to be sick or diseased so y^t^ he shall not be able to teach y^e^ s^d^ scholars that then he shall cause another sufficient & able Priest to supply his Room during his s^d^ sickness & Disease & shall pay to him such wages as they shall agree upon."

"It is also ordeynd y^t^ no scholar shall wear any Dagger Hangar or other Weapon invasive other than his knife to cut his meat with & y^t^ any scholar shall be obedient to y^e^ s^d^ schoolm^r^ for y^e^ time being in all his comdments & Demands lawfull & shall be ready to give his help & Assistance to y^e^ Correction of ev^r^y scholar of y^e^ s^d^ Free School when & as often as y^e^ s^d^ Schoolmaster for y^e^ time being shall comand them."

"Also it is ordeynd y^t^ ev^r^y scholar after he be twelve months in Gram^r^

shall use to speak to another at all times & in every Place latin & no English & y^{t} no scholar shall use Diceing or Carding nor any other unlawfull games upon pain of Correction at y^{e} Discretion of y^{e} s^{d} schoolm^{r}."

"Also it is ordeyned y^{t} if any scholar do disobey y^{e} s^{d} schoolm^{r} in his Reasonable Comandm^{t} or Correction or make any Fray upon him that then y^{e} s^{d} scholar to be amoved from y^{e} s^{d} school for ever Except y^{e} s^{d} schoolm^{r} be contented to keep him still."

"Also it is ordeynd & agreed betwixt y^{e} s^{d} Parties y^{t} one Aniversary shall be kept within y^{e} s^{d} Church of Warrington at y^{e} Costs of every of y^{e} said Schoolm^{r} for y^{e} time being y^{e} seven & twenty day of Aprill ev^{r}y year for y^{e} souls of y^{e} s^{d} S^{r} Thom^{s} & his Ancestors & his Heirs & for y^{e} soul of Dame Margret Boteler after her Decease in maner & form hereafter ensuing y^{t} is to wit y^{t} y^{e} Parson or y^{e} Curat of y^{e} s^{d} Parish Church wth seven other priests w^{ch} shall be eight in number & ten singing Clerks or schol^{rs} in y^{e} evening before y^{e} s^{d} 27th day shall together sing Placebo & Dirige & in y^{e} morning of y^{e} s^{d} 27th day y^{e} s^{d} eight Priests & ten clerks shall say y^{e} Comendations & after y^{t} at y^{r} Pleasure three of y^{e} s^{d} Priests to say masse of The Trentall of S^{t} Gregory* wth y^{e} Collect Deus simul spes nostra & iiij of y^{e} other Priests to say mass of y^{e} Aniversary & y^{e} Parson Curate or another Priest to keep mass of Requiem solemnly wth note & y^{e} other Seven Priests & ten Clerks to help to sing in y^{e} same masse & y^{e} Priest y^{t} keepeth y^{e} s^{d} masse of Requiem to have vij pence & every of y^{e} other 7 Priests to have viij^{d} for y^{r} Business & every of y^{e} s^{d} ten clerks to have ij^{d}."

"And furthermore it is ordeynd y^{t} y^{e} Bellman of Warrington wth y^{e} Bell in y^{e} s^{d} xxvj day of Aprill at afternoon shall go throu y^{e} town of Warrington & according to y^{e} custom therof desire ev^{r}y man woman & child to pray for y^{e} Souls of y^{e} s^{d} S^{r} Thomas & Dame Margret after her Decease & his Heirs & y^{t} done then y^{e} clerk of y^{e} Church of Warrington to cause three long peals to be rungen wth all y^{e} Bells in y^{e} steeple except y^{e} Sanctus Bell & so on y^{e} s^{d} 27 day as according for an Aniversary & y^{e} same Clerk to have for y^{e} Ringing xx^{d} & y^{e} Bellman to have ij^{d}."

* "Placebo" and "Dirige" are parts of the office for the dead in the Sarum Manual. An office for the dead, under the title of "The Dirige," is retained in Henry VIII.'s Primer. Under the title of "The Commendations," the Primer prints the 119th Psalm, describing it as "the A B C of Godly love, the paradise of lernyng, the shoppe of the holy Gost, the schole of truth." "Mass of the Trentall of St. Gregory" is supposed by a high authority on ritual subjects to refer to a special mass in honour of St. Gregory, in the Sarum Missal, on the 30th day after his festival. Sir Thomas Boteler's will directs "four Trentalls of St. Gregory to be said for his soule at London, at Scala Cœli, by four severall priests."

"Also it is furthermore ordeynd y^t ev^ry of y^e s^d schoolm^r w^th y^e Advice of y^e Chantre P'riest there shall give & Deal an Alms y^e s^d 27^th day to fourety poor Folkes xiij^s iiij^d that is to wit ev^ry of them iiij^d."

"Also it is ordeynd that there shall be * * * upon y^e Herse* to be made upon & over y^e grave of y^e s^d S^r Thomas viij Syrges† during y^e singing of y^e Dirige and mass afores^d * * *"

"And furthermore every of y^e s^d schoolm^r & y^e other Chantre Priest before y^e feast of Pasche yearly next ensuing shall say or cause to be s^d yearly as many other masses to fulfill y^e s^d Trentall y^t is to witt 27 Masses w^th y^e Placebo & Dirige to make and fulfill A whole Trentall * * * And after y^e s^d Aniversary * * * Quarter of y^e year to say five masses of y^e five wounds of our L^d for y^e soul of y^e s^d S^r Thomas and Dame Margret after her Decease w^th such collects as they shall think convenient."

"Also it is ordeynd & agreed betwixt y^e s^d Parties y^t y^e s^d Schoolm^r for y^e time being once in ev^ry year at y^e day of y^e s^d Anniversary shall make A true Account of all such Issues & Profits coming & growing of y^e s^d Lands Tenem^ts & Rents as he shall then have rec^d that year before * * * y^e

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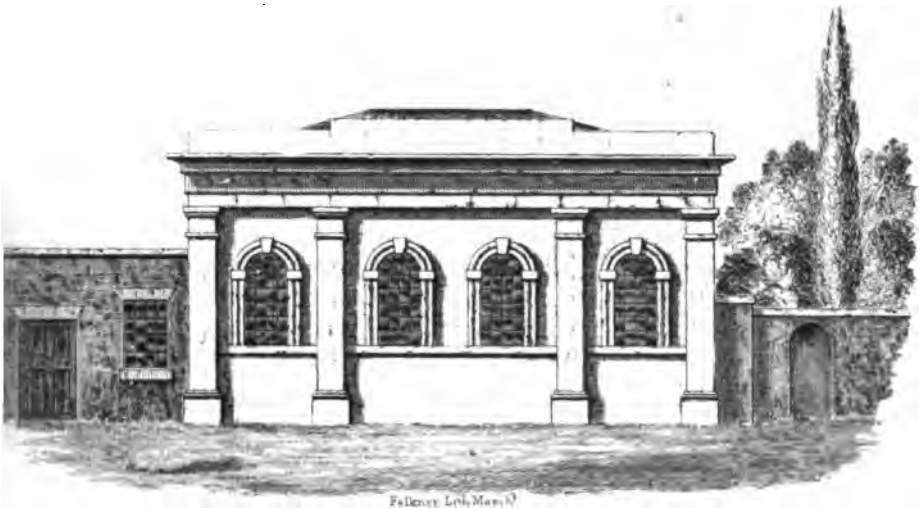
* The will of Sir Thomas Boteler directs his body "to be buriede, if it please God, in the p̄che church of Weryngton before the ymage of oure Lady in Boteler's Chapell, in the buriele of his ancestors, nere his father;" and he willed "that a stoue or convenyente tomb, with scripture graven thereupon, should be laid upon him, by the discretion of his executors." The "herse," or tomb, erected acccordingly, is described among the other monuments noticed by Randle Holme, who says:—"In the sayd chapell, on a faire marble stone, at the west end of the tombe, in brass, is tow figures, a man standing in armore, with Butler's cote on; and on his wiues cote is Delves cote; the 4 Evangelests in brass in the 4 corners, and written about—'Pray for the soules of Tho. Butler, kt., and Dame Margaret, his wife, which had one sonne and 8 daughters, vilzt. Thomas married Cicely, dau. to Peirs Leigh, Margaret to Rich. Bould kt., Ellen to Jo. Bagott, Eliz. to Geo. Booth, Isabell to Randle Brereton, Anne to Geo. Atherton, Cicely to Henry Kighley, Margery to Tho. Southworth, and Dorothy:' Sir Thomas dyed 27 Aprell, 1522." The only traces of the tomb, which have survived the various alterations in the chapel, are some fragments of brasses, preserved in the Warrington Museum and Library, and shown in our page of illustrations, one of the coats being that of Boteler, and the other Boteler impaling Delves. The third figure is probably the symbol of St. Matthew, being one of "the 4 evangelists in brass in the 4 corners" noticed by Randle Holme. The popular notion that the beautiful alabaster tomb, which adorns the Boteler chapel, is that of the founder of the Grammar School, though confirmed by the statements of Pennant and Baines, is disproved not only by the armour and costumes, but by historical evidence; the researches of Mr. Beamont, printed in the transactions of the Chester Architectural, Archæological, and Historic Society, having shown, from a manuscript of Sampson Erdswick in the Harleian collection, describing the arms formerly sculptured on the monument, that it was erected to the memory of Sir John Boteler, the father of Sir Thomas. The blanks in this and several subsequent clauses of the foundation deed are found in the earliest copies, and represent dark colored interlineations, which were undecypherable when the copies were made.

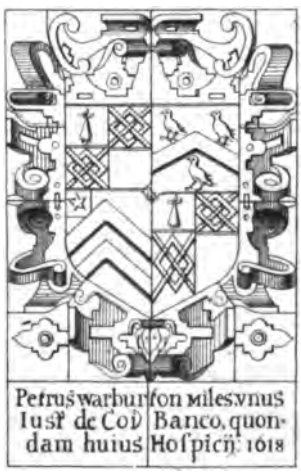
† Serges were the great wax candles burnt before the altar.

Boteler's Free Grammar School at Warrington.



New School Erected in 1829

Brasses from the Founder's Tomb.



Arms of Sir Peter Warburton, from a Window in Staple Inn Hall.

Parson or Curate of Warrington & before ye other Chantre Priest singing in Boteler's Chappell afores^d & if ye schoolm^r upon ye s^d Account made shall be found to have rec^d more money than ye sume of tene Pounds * for his Stipend for y^t year & ye costs of ye Aniv^rsary as is before expressd & named that then all ye overplus therof & ye same more money over ye s^d ten pounds & ye costs of ye s^d Aniversary * * * shall be put into A Coffer having three locks upon it & ye same money to be kept to beire ye costs & charges of ye Renuing of ye s^d Feoffment & writing of ye Deeds Schedules & Indentures concerning ye same school & for ye Defence of ye Title of ye Premisses & for ye Ornam^ts of ye s^d Chappel if need shall so require."

There is no trace of any interference with Sir Thomas Boteler's Foundation under the statute 14 Edw. VI., for the suppression of Chauntries and Trentalls. Probably the appropriation, which (looking at the words of the preamble as to the purposes to which the endowments were intended to be applied) would have been the result of any proceedings thereunder, was effected by the simpler process of neglecting the superstitious observances enjoined by the Foundation Deed. Perhaps the patrons claimed a share of the booty. At all events, we find that by the end of the sixteenth century they had contrived, to a considerable extent, to defeat the benevolent designs of Sir Thomas Boteler. His great-grandson, Edward Butler, died about the year 1586, the last male descendant of his family, having previously sold the Bewsey estates and the manor and advowson of Warrington, which by means of various assurances became vested in Thomas Ireland of Bewsey, whose family, in the 17th century, becoming extinct in the male line, was united by marriage with that of the Irelands of the Hutt and Hale, the ancestors of Mr. Ireland Blackburne. On the death of Edward Butler, the representation of his family devolved upon

* A stipend of £10, after making every allowance for the change in the value of money, seems a slender provision for "an honest and discreet priest groundedly seen and learned in grammar, and able to teach grammar;" but it is not to be attributed to any want of liberality in the views of the founder, for it is worthy of observation that precisely the same stipend was provided in some of the most celebrated foundations in the kingdom, namely that of William of Wykeham, at Winchester, Henry VI., at Eton, William of Wainflete, at Oxford (in connection with Magdalen College), and Hugh Oldham, at Manchester. It must therefore be regarded as an evidence of the low pecuniary value at which the age estimated the services of the learned, of which there is additional proof in the present deed, which provides a fee of 8d. for each of the priests "for their business" at the anniversary, and for each of the singing clerks 2d., being precisely the same remuneration to be given to the bellman for proclaiming the anniversary, while the clerk is to have 20d. for ringing the bells.

his two sisters and co-heiresses, Elizabeth, the wife of Sir Peter Warburton, one of the Justices of the Common Pleas, and Margaret, the wife of John Mainwaring. The latter had, under various pretexts, possessed himself of nearly all the School lands, partly under a grant from Queen Elizabeth, as concealed lands, partly under a lease from Sir Thomas Gerard, the last surviving feoffee, and partly, it would seem, by collusion with the Master. In the year 1602, Sir Peter Warburton, then Sergeant at Law, took upon himself to vindicate the Charity, and filed a Bill in the Duchy Court to compel the appointment of new trustees. The suit abated by the deaths of Lady Warburton and Sir Thomas Gerard; but fresh proceedings were instituted, and eventually the Court ordered "that Thomas Tildisley, Esquire, of councill with the said complainant, and Thomas Ireland, Esquire, of councill with the said defendant, and Sir John Broograve, Knight, Attorney General of this Court, umpier, should mediate some end betwixt the said parties, for the good of the said school;" and an award having been made accordingly, it was confirmed by decree on the 20th June, 1607, which provides that "the said John Manwaring, and Margaret, his wife, during the life of the said Margaret, and after the decease of the said Margaret, the said Thomas Ireland, being the owner of the Manor* of Warrington, where the said school is founded, his heirs and assigns shall have the nomination and appointment of the said schoolmaster, being an able man fit for that place, in consideration whereof, the said Thomas Ireland shall pay and bestow to and for the repairs of the said school the sum of £10, and to the said John Manwaring £20," and directions are given for the execution by all necessary parties of conveyances to new trustees, and for the future leasing and management of the trust estates, without the intervention of the master, "who shall attend his charge and have noe dealing with the setting and letting of the said lands, or imploying of the said stock or otherwise, save only with his rent and pension, and the use of the said stock, and the schoolmaster's house or chamber, with the crofts, &c., in Warrington, which order or forme of leasing is thought fit, notwithstanding the same be not expressed in the first foundation, because the late deceased schoolmaster there, having a lease from the feoffees, did assigne

* The patronage of the school did not accompany the manor of Warrington, in its transmission from the Irelands to the Booths, and from them to the Blackburnes; but seems to have been invariably exercised by the patrons of the parish church, the advowson of which has always belonged to the owners of the Bewsey estates, and is at present vested in Lord Lilford.

the same to the heir of the founder, contrary to the true intent of the foundation." The new feoffments were accordingly executed in the year 1608; and in 1610 a commission of charitable uses was issued, under which certain orders and decrees were made on the 11th September in that year, confirming the feoffments, and making provision, in accordance with the decree of the Duchy Court, for the management of the estates and the appointment of schoolmasters: and it is provided that the schoolmaster "shall by all the tyme that he shall be scholemaster of the said schole, well and truely keep the said schole, and teach and instruct the scholars thereof freely, without takeing or agreeing to have any reward, stipend, or schole-hyre, or any other thing, for teaching any scholar of the said schole, other than the stipend to be paid by the said feoffees or governors, and upon every schole day shall be and continue in the said schole three hours att the least in the forenoon, and three hours att the least in the afternoon, teachinge, hearinge, and examininge his schollers, if his health will permit, and shall every morning, together with his scholers, use some forme of prayer meet for the purpose, giveing thanks to God that stirred upp the hart of the founder, Sir Thomas Butler, Knight, to soe good a work, and likewise at night before they depart." The decree of the commissioners was duly confirmed; and thus the estates were restored to the foundation by the perseverance and public spirit of Sir Peter Warburton, who further testified his good will to the school by granting to it a rent-charge of £5 per annum, issuing out of a messuage in Chester. It is still received by the trustees; and though the altered value of money makes his gift of smaller pecuniary importance than he intended, it has entitled him to the gratitude of the inhabitants of Warrington, in testimony of which one of our public spirited antiquaries has deposited in our Museum a copy of Sir Peter's arms, from a window in the hall of Staple Inn, of which he was a Bencher. A drawing of the arms forms one of our illustrations.

The new system of management does not seem to have been much more successful than the old; for within about half a century we find the income of the school in danger of being almost wholly lost, in consequence of claims set up by the tenants to have their leases renewed at the almost nominal rents they were then paying. Active measures were taken, and the principal part of the tenants were brought to submit to take leases at rack rent in 1677. It will, however, be convenient to defer any notice of

the subsequent events affecting the history of the school, until I come to speak of the respective masters, of whom I am fortunately able, from various sources, to make out a tolerably complete list.

Sir Richard Taylor, the master appointed by the foundation deed, as little disturbed by the storms in the political and religious atmosphere as his contemporary, Symon Symonds, the veritable vicar of Bray (for I suppose it is settled that the vicar of "good king Charles's golden days" is a myth), appears to have retained his mastership during the reigns of Henry VIII., Edward VI., Mary, and Elizabeth; for he is last heard of on the 20th December, 1569, when he renewed a lease for ten years of part of the school estates in Wigan. I am not aware of any other mention of him, unless (as suggested by my friend, Mr. Beamont, to whom I am indebted for information and references on various points not specifically acknowledged) he be the person referred to in the Inquisitio post mortem of Sir Thomas Boteler, 4 July, 14 Hen. VIII., which finds that he was seized (inter alia) "De homagio et servitio Rici le Tailor."

John Wakefield probably succeeded him; for we find him as early as the 29th September, 1576, joining with the trustees in an assurance of the same lands. He took, under the will of Edward Butler, the great grandson of the founder, dated November 2, 1586, a legacy of £40, and was nominated one of his executors, but did not prove the will. He died in the year 1605, and was buried at Warrington on the 30th May in that year.

The entry in the parish register, on the 9th March in the same year (viz., 1605–6), of the baptism of a daughter of "Robert Martin, ludi magister," is perhaps too slight evidence of the person referred to having been master of Boteler's Free Grammar School; and in the year 1608 we find the name of Ottiwell Rynse, described as schoolmaster, attached to the feoffment above referred to, as a witness to the livery of seizin.

I know of no other mention of him; nor have I met with the name of any other master between him and Nathan Ashworth, whose name frequently occurs in the register of the baptism of his children. The earliest of these entries which describes him as "ludi magister" is that of a son, baptized on the 21st April, 1627; but there is an entry, in which his name occurs without that addition, on the 30th April, 1623, which may have been previous to his appointment, especially as the fact of his

having been a native of Warrington is rendered not improbable from a John Ashworth having been rector there from 1589 to 1607. The submission of the tenants to take leases at rack rent is attributed, in some memoranda on the school affairs, in the handwriting of Mr. Owen, one of the later masters, to the exertions of his predecessor, Samuel Shaw; but the date of the submissions, which are still in existence, shews that this was a mistake, and that the proceedings must have been commenced during the mastership of Ashworth; and as the trustees do not seem at this period to have interfered much with the charity, it was probably owing to his exertions, in a great measure, that the endowment was preserved. He was buried at Warrington, on the 13th February, 1672–3. He must have been the schoolmaster referred to, but not mentioned by name, in the *Life of Adam Martindale*, p. 176.

The name of JOHN WRIGHT occurs on the 14th August, 1677, occupying (as that of the master of the Grammar School usually did) the next place to the rector, in the minutes of the proceedings at a parish meeting. He was buried at the parish church on the 3rd September, 1679. It was during his mastership that the proceedings against the tenants were brought to a successful issue.

The name of "J. CLAYTON, sch. m^{r} de Warrington," occurs at parish meetings on the 22nd June, 1680, and 5th June, 1681; and the parish register records the burial, on the 10th November, 1686, of "Mr. JOSEPH WILLOTT, scholemaster of the Free Scoole," but I have met with no other mention of either of them.

SAMUEL SHAW succeeded to the mastership in 1687, having previously held a similar office at Wigan. The Diary of bishop Cartwright, published by the Camden Society, mentions that on his way to take possession of his bishopric, and of the rectory of Wigan, which about this period was frequently held in commendam with it, he was met at the latter place by the mayor and aldermen and a number of gentlemen, and saluted with an elegant speech in Latin, and as well delivered, by Mr. Shaw, the schoolmaster. Under the subsequent date of 28th January, 1687, he states that he gave Mr. Samuel Shaw, of Wigan, a licence to teach the Free School of Warrington. The favorable impression made on the bishop by the latin speech seems to have been a permanent one, as the diary contains frequent memoranda of the interchange of hospitalities between the prelate and the

master of the grammar school of Warrington. He considerably improved the master's house, and left a memorial of the fact in the shape of a stone tablet, still existing over the doorway, with the inscription "1688, Samuel Shaw, A.M." He obtained the consent of the trustees to the commencement of proceedings, at his own risk, for the recovery of some lands which were apparently lost to the charity, and which, after many years of litigation, were restored to the school. In 1690–1, he was presented to the rectory of Warrington, which was in the gift of the Atherton family. It was at this period of very little pecuniary value, an improvident lease for 200 years having been granted of the tithes, in the 34th year of Henry VIII., reserving a rent of £20, and the lessees covenanting with Edward Keble, the then rector, to find him and his successors a sufficient priest, to officiate in all sacramentals and services belonging to the church. The lease became part of the possessions of the owners of the Bewsey estates, who allowed the rector (as he was still called, notwithstanding the impropriation) to receive the small tithes, in lieu of having a priest found him according to the terms of the lease. We are informed by Mr. Canon Raines, in a note to *Gastrell's Notitia Cestriensis*, (ii, 233,) that Mr. Shaw held the office of King's preacher, being one of the four preachers sharing a royal stipend of £200, first established by Queen Elizabeth, and afterwards regulated by James I, "out of zeal to God's glory, and care of the souls of many thousands of his majesty's subjects within the county of Lancaster, there being great want of maintenance for preachers in most places of that shire," and appointed to preach among the impropriations there, according to the appointment of the bishop. In a letter to Bishop Stratford, in 1693, Mr. Shaw states that he, and others for him, had preached above forty sermons during the previous half year. His principal charge, as king's preacher, was Hollinfare, a chapelry within the parish of Warrington, where he preached two sermons per month, until a regular curate was found, in the person of the Rev. John Collier, the father of our Lancashire worthy, Tim Bobbin. Mr. Shaw continued to hold the office of master of the grammar school until his death, in the year 1718. He was buried at Warrington on the 30th September.

The Rev. John Tatlock was next nominated to the mastership, but the Bishop refused to license him. An extract from the correspondence of Bishop Gastrell, among the *Lanc. MSS.*, for which I am indebted to the kindness of Mr. Canon Raines, furnishes the grounds for the refusal. In

Boteler's Free Grammar School at Warrington.

The Master's House

a letter dated from Christ Church, Oxford, 5th Nov., 1718, and addressed to his secretary at Chester, the Bishop writes:—"Mr. Tatlock holds the place for Mr. Hayward, till he is in orders, but I hope wthout Bond. If upon examination w^{n} he applies for a Licence you find he has given Bond, let him have none, and plead my generall order to you for your refusall. I have enclosed the nomination." The refusal of a licence on such grounds must be regarded as somewhat of a stretch of episcopal authority, for even if it had been as settled law then as it is now, that the appointment of masters of Grammar Schools is matter of ecclesiastical cognizance, there could have been no pretence for treating such an appointment as a *benefice*, so as to render a bond of resignation simoniacal; and I can imagine no other ground for the Bishop's objection. It was however submitted to. Mr. Tatlock resigned the appointment, and on the 22nd March, 1719–20, a nomination was made of the Rev. THOMAS HAYWARD, M.A., of Brazennose College, Oxford, reciting the former nomination, the Bishop's refusal of a licence, and the resignation of Mr. Tatlock; and Mr. Hayward was duly licensed accordingly. He was born on the 5th February, 1695–6, a native of Warrington, and the son of Thomas Hayward, an attorney there. He was twice married, and had issue no less than 16 children. In an obituary notice of one of them (Francis Hayward, M.D., who died at Bath in the year 1831, at the advanced age of 92, and was the father-in-law of the Rev. Joseph Hunter, the learned assistant keeper of the records) it is stated that the Rev. Thomas Hayward was instituted to the vicarage of Garstang, on the 4th March, 1722, and resigned it in 1731, and about that time removed to Warrington. There is unquestionably an error in the date of the latter event, as I have procured my information direct from the original documents in the Episcopal registry at Chester. As early as the 31st March, 1719, we find Hayward's signature, with the addition of "ludi m^{r}," occurring next to that of the rector, in the proceedings of a parish meeting; and there is a receipt, signed by him and Anne Shaw, for rents due to the master in November, 1718, lodged, apparently by accident, with the documents at Chester. It may be inferred from these facts that, even during Tatlock's nominal mastership, Mr. Hayward was performing the duties and in receipt of the emoluments of the office. There can be no doubt, however, that his presentation to the vicarage of Garstang was subsequent to his appointment to the Grammar School; and accordingly, in a note to *Dr. Parkinson's* "*Old Church Clock*," containing extracts from the diary of

the Rev. Thomas Parkinson, curate of Garstang, in which it appears that Mr. Hayward officiated there at Easter, 1723 and 1724, it is stated that he was non-resident. In 1728, the Chapel of Sankey, near Warrington, which had up to that time been used as a Presbyterian place of worship, was rebuilt, and placed under Episcopal government, *(Notitia Cest.* ii, 215,*)* and Mr. Hayward became incumbent, which probably led him to resign his living at Garstang; but he continued to fill the office of master of the Grammar School. The obituary notice above mentioned, quotes the biographer of Dr. Percival, who was one of Mr. Hayward's pupils, for Mr. Hayward's character as "an able but severe master, an admirable scholar, and a very useful man." He is mentioned also in the *Remains of John Byrom, (*i, 315*)* who addresses a sportive invitation in verse to him and Mr. Haddon, the rector of Warrington. The error in the note to the passage referred to, naming 1731 as the date of his death, is attributable to Baines. Mr. Hayward died in 1757, and was buried at Warrington on the 2nd September.

The Rev. JAMES ANSDELL, of Bunwell, Norfolk, was nominated to succeed him, and presented to the bishop, if not actually licensed; but he subsequently wrote to the bishop, that in consequence of the augmentation of his salary he had determined to continue his residence there; and he accordingly resigned the appointment, and on the 4th November, 1757, the Rev. EDWARD OWEN, M.A., then usher of Great Crosby School, as stated in a memorandum endorsed on his appointment, in the Episcopal registry, was nominated in his stead. He states, in some memoranda to which I have had access, that he found the school in a dilapidated condition, the building in ruins, the roof ready to fall in, and the floors and walls all clay. He at once put it into a state of thorough repair, converting some outbuildings into a dining room and bedrooms, and rendering the house fit for the reception of boarders, which, he states, it never was before. Mr Owen was a scholar, whose attainments were eminently calculated to extend the reputation of the school; and it seems accordingly to have been in a flourishing condition during the early years of his mastership. Among his scholars, who in after life attained a position of eminence, the name of the Rt. Hon. George Tierney deserves to be particularized. Mr. Owen's translation of Juvenal and Persius, published in two vols. 12mo. in 1785, when he must have attained the ripe age of 57, or thereabouts, has given him a permanent place in classical literature, though it has not maintained

its ground against the spirited translation of Gifford. He also published in 1770 a Latin Grammar, under the title of "The Common Accidence improved." From the preface to a new edition, published in 1800, it appears to have been adopted in various schools, where "the masters felt themselves under no restraint from local statutes, or the ascendancy of custom or fashion." In the year 1767, the rectory of Warrington, now improved in value by the falling in of the lease granted in the reign of Henry VIII., became vacant by the death of the Rev. William Farington; and the patron, Mr. Gwyllim, presented Mr. Owen to the living, in testimony of respect for his attainments. He continued to reside at the school-house, the rectory being in a somewhat dilapidated condition, and retained his mastership until his death. His personal and literary merits are attested by Gilbert Wakefield, whose praises can scarcely be suspected of proceeding from a too partial source, and who, while doing justice to the "propriety, perspicuity, and elegance of his style," speaks of him as "a man of most elegant learning, unimpeachable veracity, and peculiar benevolence of heart." It must be confessed, that during the latter years of his mastership, his increasing years, infirmity, and deafness incapacitated him in a great measure for the duties of his office; and the school seems at this period to have lost much of its usefulness. He appears, from his will, which mentions several relatives in Montgomeryshire, to have been connected, both by family and property, with that county. He died in the year 1807, at the age of 79, and was interred, according to the directions of his will, "in the chancel of the church of Warrington, on the south side of the grave of Samuel Shaw, a very worthy predecessor of his, and the place of his interment marked with a small square marble, inscribed only with his name and title, age, and time of decease." A portrait, which persons still living, who remember him, pronounce an admirable likeness, is in the possession of Miss Lee, of Grappenhall.

The Rev. Robert Atherton Rawstorne was appointed to succeed him as master; and having within a few months afterwards been presented to the rectory, he appointed the Rev. William Bordman, as his usher, to whom he left the entire management of the school, and allowed him the use of the school-house, thus converting the mastership into a sinecure, and exciting the resistance of the inhabitants of Warrington, who had seen with regret the gradual decay of the school, and had only been deterred from taking active measures by the consideration that the course of nature must

shortly terminate the mastership of Mr. Owen. In 1810, an information was filed in the Court of Chancery, at the instance of several influential inhabitants, in order to test the right of Lord Lilford to the patronage of the school, and to procure a declaration of the court that the office of master was incompatible with that of rector of the parish. In the first of these objects the promoters of the suit failed; but the court, in 1814, pronounced a decree, declaring the incompatibility of the offices, and that Mr. Rawstorne, by accepting the living, had vacated the mastership.

The Rev. WILLIAM BORDMAN, M.A., who, as usher to Mr. Rawstorne, had practically been the master of the school since 1808, was thereupon formally appointed master in 1815. He had previously been second master to Dr. Valpy, at Reading, and was a person of no mean attainments; but the circumstances under which he commenced his mastership were not conducive to his popularity, and he acquired, whether justly or unjustly, the reputation of being one of those "Ajaces flagelliferi," whose race is fast disappearing under the humanizing influence of public opinion at the present day. Repeated complaints against him came under the notice of the trustees, and eventually an arrangement was proposed in 1827, and carried into effect in the following year, by which, in consideration of a round sum of £400, and a pension of £150 per annum, to be deducted from the income of his successor, he resigned his mastership. He was living, a few years ago, at Honfleur.

In the meantime, the Chancery suit had resulted in the establishment, in the year 1820, of a scheme for the future management of the school, providing for such an extension of the plan of education as was consistent with the primary object of the foundation, as "a school for teaching grammatically the learned languages;" and a brighter prospect opened. I have no means of tracing the circumstances which led to the appointment of any of the masters previous to Mr. Rawstorne; but it is satisfactory to find evidence that at all events his three immediate predecessors, whose masterships extended over 120 years, were all men of attainments well qualifying them for the office. On Mr. Rawstorne's appointment the mastership seems to have been treated as a mere appendage to the rectory; and when this arrangement was defeated, the appointment, as his successor, of the gentleman whom he had selected to perform the duties of the office as his deputy, followed almost by accident. On the resignation of Mr. Bordman, the patron proceeded to an appointment in the manner best

calculated to promote the interests of the school, and selected, as the most eligible candidate for the office, the Rev. THOMAS VERE BAYNE, of Jesus College, Oxford, and, I believe, a native of that city. He was born on the 25th of October, 1803. Under his mastership the school speedily recovered the popularity which it had lost under his predecessor, and its increased efficiency was manifested in the imperative necessity for accommodation for an increased number of scholars. In the year 1829, with the sanction of the Court of Chancery, a fund, which in the course of the litigation had been paid into court, was expended in the erection of a school, capable of accommodating 120 boys. It is a plain stone building, with little pretension to architectural effect, and forms one of our illustrations. While I avow the partiality of an attached pupil, owing to Mr. Bayne the most valuable portion of my education, I may be excused from discussing his merits; but few will deny him the character of an accomplished classical scholar. He resigned his mastership in the year 1842, to accept the incumbency of St. John's Church, Broughton, and died on the 22nd of December, 1848.

His successor was the Rev. HENRY BOSTOCK, M.A., of Wadham College, Oxford, formerly master of the Grammar School at Aylesbury, which he left to accept his present appointment. He was selected, like his predecessor, from a number of candidates, solely with reference to his scholastic attainments. The success which has attended his pupils is the best evidence of his abilities as a teacher. The small population of Warrington cannot be expected to furnish many scholars to proceed to the Universities, and it is therefore gratifying to notice that of those who have done so during Mr. Bostock's mastership, five have obtained scholarships and prizes at Oxford and Cambridge—a sixth has attained to distinguished honours, both in classics and mathematics, at the University of Durham—and a seventh, after obtaining a scholarship and mathematical prize at Cambridge, has within the last month taken a Wrangler's degree.

With such evidence, I need say nothing of the present condition of the school; and it only remains for me to mention, by way of bringing down its history to the present time, that in 1840, the sale, on what appeared very advantageous terms, of a portion of the school estates, afforded an opportunity of obtaining, at the purchaser's expense, an act for regulating the future management of the school; and the education which it at present affords is one alike consistent with the views of the founder and with the

requirements of modern times. Though it does not profess to give a commercial education, in the sense entertained by those who will not recognize the utility of any knowledge which is not available for the immediate purposes of the counting-house, the instruction afforded is by no means confined to Greek and Latin; but while opportunities are afforded for the study of modern languages, the ordinary course of study embraces even the higher branches of mathematics, and, in fact, such an education as qualifies its scholars to take their places in the world as educated men, or to compete at the Universities, as we have seen they can do, with pupils from the most celebrated of our educational foundations. I am well aware that popular feeling is by no means unanimous in regarding an education such as that afforded at Boteler's Free Grammar School as the most desirable to be adopted in a manufacturing town; but I entertain a strong opinion that, in keeping up a certain amount of classical knowledge, the Grammar Schools of this kingdom are rendering a service to the country, which would not be effected by institutions partaking of a more commercial character. Such schools as the opponents of classical learning would wish to see established in their place would at best only be rivals of private establishments, at which the instruction intended for those who seek no higher degree of mental cultivation than will fit them for the pursuits of retail trade is in every town procurable, at a cost, the saving of which was not the object of the founders of our Grammar Schools; while, on the other hand, an education fitted to qualify a youth for one of the learned professions, or for an honorable career at the Universities, would, but for institutions like Boteler's Free Grammar School at Warrington, be almost inaccessible to any but the sons of the wealthy.

THE ANCIENT GEOMETRICAL ANALYSIS, ILLUSTRATED FROM THE WRITINGS OF THE LANCASHIRE GEOMETERS.

By T. T. Wilkinson, F.R.A.S., &c., &c.

(Read 15th May, 1856.)

The cultivation of the Ancient Geometrical Analysis appears to have been a favourite subject with the mathematicians of the sixteenth and seventeenth centuries. During the former period, Commandine completed his translation of the *Mathematical Collections of Pappus*, which he enriched with numerous additions of his own; Vieta published a Restoration of *Apollonius on Tangencies;* and our own countryman, Dr. Dee, prefixed his celebrated preface to what is usually known as Billingsley's *Euclid.* The latter period is more particularly distinguished for the many attempts to restore the lost treatises of the Greek geometers, and to exemplify the true nature of their methods of discussing geometrical propositions. Amongst those who succeeded best in these respects, we may instance Ghetaldus, who reproduced the *Inclinations*, and furnished a supplement to Vieta on the *Tangencies;* Snellius, who wrote on the *Determinate Section* and the *Sections of Ratio and of Space;* Schooten and Fermat, who either wholly or partially considered the *Plane Loci* and the *Porisms.* Besides these, we may enumerate the names of Sir Henry Saville, Anderson, Gregory St. Vincent, Pascal, Desargues, Girard, Hugo D'Omerique, Huyghens, and more latterly, Halley, Simson, and Stewart; all of whom contributed by their writings and example to revive a taste for the study of those forms of pure geometry, which had lain dormant for more than a thousand years after the Saracens destroyed the library at Alexandria.

It must not, however, be concluded from the presence of several English names of good repute in the preceding enumeration, that the study of the ancient geometry was then pursued so sedulously and so successfully in this country as on the continent. The names of Halley, Simson, and Stewart, belong to the eighteenth century rather than to an earlier date. They formed, too, almost isolated instances in their respective generations, and

the state of geometrical science even at the Universities of Cambridge and Oxford may be judged of from the fact that Sir Isaac Newton always blamed himself for having studied the works of Des Cartes, and other algebraical writers, at the commencement of his mathematical studies, before he had paid due attention to the *Elements of Euclid.*

It was not until after the publication of Thomas Simpson's *Algebra* and *Geometry*, which contained a large collection of geometrical problems constructed and demonstrated, that the taste for pure geometry began to diffuse itself amongst our mathematicians generally. His *Select Exercises* laid down the principles of the ancient geometrical analysis in a manner intelligible to the majority of students; and the publication of geometrical questions in the *Lady's* and *Gentleman's Diaries*, and other similar works, paved the way for that complete development of the system which took place after the Rev. John Lawson had rendered the attempted restorations of the works of Apollonius, and a sketch of the Porisms of Euclid, accessible to non-academic readers. The works of Halley, Simson, and Stewart, from the circumstance of their being written in Latin, were sealed books to the great bulk of those whose names appear in the periodical scientific literature of the day, and had it not been for the aids just noticed, most probably the complaint made by Dr. Simson in 1767, that "the taste for the ancient geometry, or indeed any geometry, seems to be quite worn out," would have been every whit as just half a century later, as it was during the period in which his Latin treatise on the *Loci Plani* "did not sell."

At the very time, however, that Dr. Simson was thus despairing of his favourite science, a band of men was rapidly forming in the north and south of England, whose lives were to be consecrated to the study of pure geometry; and although the sound of their fame had not then penetrated the seclusion of his Alma Mater, the labors of themselves and their pupils were destined ultimately to change the whole face of mathematical science, and even to induce a return to more logical systems in the leading educational institutions of the country. The *Lady's Diary*, the *Mathematician*, the *Mathematical Exercises*, and the *British Oracle*, conducted by Simpson, Rollinson, Turner, and Lawson, laid the foundations of the reform during the lifetime of the Glasgow professor; and after his decease, the *Gentleman's Diary*, the *Mathematical Repository*, the *Mathematical Companion*,

and numerous minor serials, under the direction of Wildbore, Leybourn, Hutton, Hampshire, Davis, and others, continued to foster the study and develop the powers of such proficients in our own county as Butterworth, Wolfenden, Smith, Hilton, Cunliffe, Bazley, Campbell, Simpson, Kay, Holt, and Swale.

The Greek geometers are well known to have divided their course of study into what they termed the *first* and *second* elements. The former they subdivided into two parts, corresponding respectively to our elementary principles, and the practical measurement of plane figures; the latter contained the whole of those ingenious speculations of Euclid, Apollonius, and others, which find their counterpart in the higher geometry of the Continental mathematicians. According to Pappus, they were accustomed to employ two methods for the demonstration or discovery of geometrical truths. The first process was termed Analysis, or the resolution into parts; the second received the name of Synthesis, since it consisted principally of the art of composition. By analysis is meant that process of reasoning by which we proceed, step by step, from the entities sought, as taken for granted, until we arrive at one or more simple truths already known; whence we conclude that the entities supposed to be given, or true, at the outset are really so, and the steps by which we arrived at the simple known truths are generally such as to indicate the construction and demonstration of the proposition, or, at all events, to point out its impossibility under the given conditions. Synthesis, on the contrary, commences by advancing some known truth, or truths, respecting the proposition proposed, and it proceeds, step by step, to the theorem required to be demonstrated, or to the problem to be constructed. Analysis, in fact, searches the given—Synthesis gives the sought; whilst both may be regarded as general types of the *re*gressive and *pro*gressive forms of logical deduction.

When applied to purely geometrical enquiries, the two methods differ only in their point of departure, for the reverse of one process always reproduces the other. In the application of the analytical process to the demonstration of theorems, or to the construction of problems, we first of all suppose the theorem to be true, or the problem to be actually constructed. We then proceed to examine such consequences as may result from these admissions, by calling in the aid of any other properties of the requisite diagrams which may be already known. Should these consequences prove

to be false, the process constitutes a *reductio ad absurdum*, which proves that the supposed theorem is not true, or that the construction of the proposed problem is impossible from the given data; but if none of these happen to be known truths, or possible operations, we must examine other consequences in connection with other properties of the diagrams, until we arrive at a result which is already known to be true, or a construction which is admitted to be possible. When such is the case the analysis properly ends, since it is obviously unnecessary to trace every thing back to the *elements* or to the *data* of Euclid, and nothing more remains for the student to do than to deduce his construction and add the synthesis or demonstration, by reversing the steps of the analysis.

From what precedes, it is evident that the analytical process is most properly applied to the solution of problems, whilst synthesis adapts itself more particularly to the demonstration of theorems. The former is professedly the instrument of research and a means of invention, by which new truths are discovered; the latter adds to our knowledge by demonstrating the truth of those relations which have presented themselves, either accidentally, or from necessity, during the process of resolution. It is impossible to lay down any general rules, by which all geometrical analyses may be conducted. The nature of the inquiry, and the relations which exist amongst the data, exercise an influence which must not be neglected in the selection of the course to be pursued. In particular cases, lines must be drawn in certain directions, of given lengths, or having given ratios; angles must be formed at given points, of given magnitudes; circles must be described with given radii, from given centres; the intersections of certain loci are sometimes either to be obtained or conceived; tangents must be drawn from given points to given circles; and many other contrivances which daily present themselves to the geometer must occasionally be taken advantage of, before the demonstration of a theorem or the construction of a problem can be obtained; and it is in a ready selection of the best means, and in the judicious disposal of such preliminary constructions and arrangements, that the superiority of an adept renders itself manifest. There is a *taste* and an *elegance* to be found in geometrical processes quite as marked in character as the *sublime* and the *beautiful* in poetry or prose; and the gifted geometer is as easily distinguished by his writings as the talented author of a novel, a history, or a poem; for although the inspirations of genius may manifest themselves in

totally opposite directions, they are as clearly discernible in the walks of abstract science as they are in the more widely appreciated pursuits of literature.

The complete resolution of any proposition by means of the ancient geometrical analysis, generally consists of *six* distinct parts, although in some particular cases, one or more of these may be conveniently omitted. We have—

Firstly—the hypothesis and preparatory construction.

Secondly—the examination of the relations existing amongst the data and quæsita of the proposition.

Thirdly—the construction or final solution.

Fourthly—the demonstration.

Fifthly—the discussion of particular cases, and the determination of the limits within which the problem is possible.

Sixthly—the corollaries deducible from the whole of the process.

The hypothesis and preliminary construction are obviously essential to every geometrical proposition; but the former may be deficient or redundant, according as the data are too few, or too many, or not sufficiently limited to enable the geometer to attain the object proposed; whilst the latter may consist merely of the most simple operations. In all cases where the analysis and construction are given, the synthesis or demonstration may be, and generally is, omitted; and, on the other hand, the analysis is not often required where the construction and demonstration are given at length. The ancient geometers, however, appear to have been very careful to furnish all the parts of a solution in consecutive order, nor did they rest satisfied until they had thoroughly examined all the special cases of the subject of inquiry. The moderns do not often imitate them in this respect, but content themselves, in most instances, with giving the solution of a general case, and leaving the particulars to be elicited by the student. The Greek geometers were accustomed to proceed from the *particular* to the *general* by a series of easy gradations; we usually attack the general proposition at once, and deduce the particulars from the results.

As an illustration of the application of analysis and synthesis to the investigation of the truth of a theorem, we may select the nineteenth proposition of Dr. Matthew Stewart's *Propositiones Geometricæ*. Its solu-

tion offers little difficulty, nor does it require much preliminary construction, but it is not the less valuable as an example, since it presents a perfect specimen of the entire agreement of both processes when taken in *direct* and *reverse* order.

THEOREM.

If from any point C in the diameter of a circle AB produced, a tangent be drawn to the circle; and if from the point of contact D a perpendicular DE be demitted upon the diameter; then will AC : CB : : AE : EB.

ANALYSIS.

Suppose the theorem true, and let ADB *(fig.* 1) be the circle, F its centre, AB its diameter, C the point in the diameter produced, D the point of contact, and DE the perpendicular. Join FD.

"Then since AC : BC : : AE : BE,
and AB is bisected in F,
[by a known property] we have CE. FE = AE. EB,
Add EF^2 to each of these rectangles.
Then CF. FE = AF^2 = DF^2,
$\therefore$ CF : DF : : DF : EF,
or the triangles CDF and EDF are equiangular.
$\therefore$ angle CDF = angle DEF.
But the angle DEF is a right angle,
$\therefore$ the angle CDF is also a right angle, and
$\therefore$ CD touches the circle at D."

SYNTHESIS.

Premising the same preliminary construction as before, we find that—

"Because CD touches the circle at D,
the angle CDF will be a right angle;
and since DEF is a right angle,
the angle DEF = angle CDF and
the triangles EDF and CDF are equiangular.
$\therefore$ CF : DF : : DF : EF,
and $\therefore$ CF. FE = DF^2 = AF^2.
Take EF^2 from each of these,
$\therefore$ CE. EF = AE. EB.
But AB is bisected in F, and consequently
[by the preceding known property]
AC : BC : : AE : BE." Q. E. D.

FIG 1.

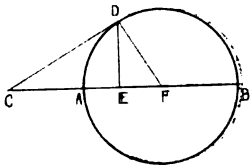


FIG 2.

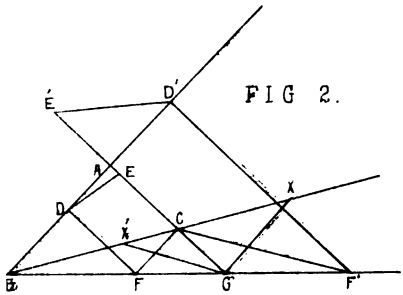


FIG 3.

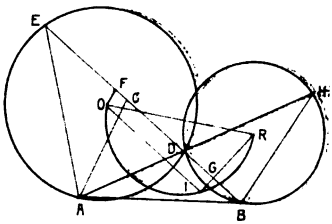


FIG 4.

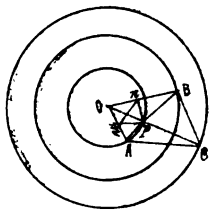


FIG 5.

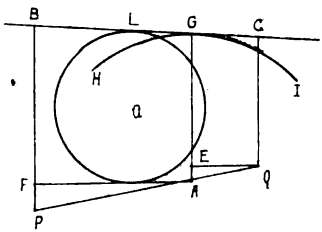
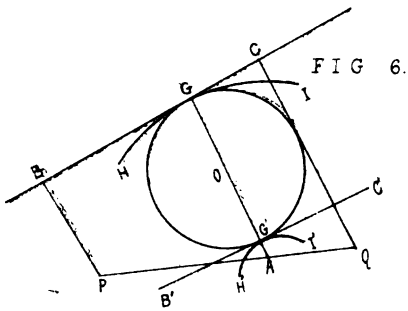


FIG 6.



ANCIENT ANALYSIS.

This theorem forms a fundamental proposition in the modern doctrine of poles and polars, with regard to the circle. C is the *pole*, DE the *polar*, and the enunciation merely states the fact that they divide the diameter, or indeed *any* line drawn to cut the circles, in harmonic proportion. The property is also true with respect to the conic sections, as may be seen by referring to La Hire's treatise on the subject, published A.D. 1685, and to many later works.

Almost the whole art of solving geometrical propositions consists in reducing the given data, and their relations to each other, to more simple forms. The greater the number of data, or their relative non-connection with each other, the greater, in general, will be the difficulty of the analysis. The object of this process is confessedly to diminish the number of separate data, until we arrive at the simplest possible conclusion, or the case where there is only one entity to determine; and hence we find that many of the more difficult geometrical inquiries are gradually traced through a series of more and more simple propositions, until we arrive at one respecting which there can be no difficulty. Thus, if it were required to solve the following:—

PROBLEM.

"In the triangle ABC, place a right line DE, such, that the non-adjacent segments DB, EC, and the line DE, shall have given ratios to each other." (Lamè's *Examen de Different Methodes en Géométrie.)*

ANALYSIS.

Suppose DE *(fig. 2)* to be the line drawn as required; draw DF and CF parallel to AC and DE respectively; also join BF and produce it to meet AC produced in G. Then AG : AB : : DF : BD : : EC : BD.

But EC : BD is a given ratio by hypothesis,
and consequently AG : AB is a given ratio.

The triangle ABG is therefore given and may readily be constructed, which reduces the problem to that of 'having given the triangle ABG and a point C in its base, to draw a right line DF parallel to AG, so that DF : FC may be a given ratio.'

Again, suppose the thing done, and draw GX parallel to FC, meeting BC produced in X, if necessary.

Then GX : FC : : BG : BF : : GA : FD.
And GX : GA : : FC : FD : : ED : EC.

But this last ratio ED : EC is given, and consequently the problem is further reduced to that of finding 'a point X upon the line BC such that GX : GA may have a given ratio to each other.' This is obviously nothing more than finding a fourth proportional to three given lines [and hence the analysis properly ends at this stage of the process]. It may be remarked, however, that there are two points X and X^1, which satisfy the conditions, and consequently the problem admits of the two solutions indicated by the diagram."

In like manner, if it were proposed "to describe a circle (O) to touch three given circles (O_1), (O_2), (O_3), whose radii are respectively r_1, r_2, r_3"; we may suppose the problem solved, and that an auxiliary circle is described with centre (O) to pass through O_1 and touch two circles having their centres at O_2, O_3, and radii $= r_2 - r_1$ and $r_3 - r_1$ respectively. Were this auxiliary circle actually described, or determined, the proposed object would evidently be accomplished; but since this is not the case, the question is now merely reduced to that of "describing a circle through a given point, which shall touch two given circles." By again supposing this latter problem solved, a very easy analysis conducts us to the *double* problem of "producing a given line, so that the product of its segments shall be equal to a given rectangle," and of "describing a circle which shall pass through two given points, and touch a given circle." The former offers no difficulty whatever, whilst the latter, by an almost obvious process, comes at once to the simple operation of "describing a circle through three given points;" and, consequently, by collecting the operations contained in the various steps of these analyses, the construction of the original problem is gradually evolved.

When a similar method of procedure is adopted, the "inscription of a polygon in a given circle, so that its sides and diagonals shall pass through given points" is reduced—*firstly*, to that of "describing a triangle in the circle," subject to similar conditions; *secondly*, to that of drawing two lines from two given points to intersect in the circumference of a given circle, such, that their chord of intersection shall be parallel to a given line;" *thirdly*, to that of "drawing a line through a given point, so as to cut off a given arc from a given circle;" and *lastly*, to that of "drawing a line

from the given point to cut the given circle, so that the intercepted chord shall be of a given length ;" a problem which obviously requires no further reduction. Both of these general problems possess considerable historic interest. The former is well known as the principal case of Apollonius on *Tangencies*, whilst the latter, besides being intimately connected with the difficult subject of *Porisms*, has occupied the attention of several of the most eminent mathematicians, both of this country and on the continent. The principles of their various methods of investigation have been amply discussed by Professor Davies, in the third volume of the *Mathematician*, and Mr. J. H. Swale has reduced the whole to very simple processes in the two numbers of his *Liverpool Apollonius*.

The construction of plane triangles from given data has long been a subject much cultivated by non-academic and other geometers. Its interest is at least as old as Pappus, and it was pursued to a considerable extent in more recent times, by De Billy, Hugo D'Omerique, and other writers of later date. Sir Isaac Newton gave some examples of this kind, treated by Algebra, in his *Arithmetica Universalis*, and Thomas Simpson added many more general cases to the number, in the appendices to his treatises on *Algebra* and *Geometry*, but the full development of the system was reserved for the correspondents of our mathematical periodicals. Synopses of data for the construction of triangles have been published at different times by Lawson, Leybourn, Farey, and others; whilst the more intimately connected properties gradually evolved during the consideration of particular cases have been collected under the heads of "Modern Geometry," in the *Student;* "Symmetrical Properties" in the *Philosophical Magazine* and in the *Repository;* and the more recent "Horæ Geometricæ," in the *Lady's and Gentleman's Diary*. It does not, however, appear that the results have been at all commensurate with the vast amount of labor expended upon such constructions. Most questions of this nature may be more justly described as "ingenious puzzles," than as aids to the real progress of the student, and hence of late years the practice of proposing such problems has justly fallen into neglect. For occasional praxis, they may be resorted to with considerable advantage, but to carry them to the extent which they occupy in the *Mathematical Companion*, and other similar works, is "geometrical trifling" of the most unprofitable description.

In some instances, however, the analysis conducts us to results, or to

properties of the requisite diagrams, which no other process would readily supply; and not a few examples might be adduced where one or more of the great problems of antiquity lie hid under the disguise of the data for constructing a plane triangle. Thus, when "the base, the vertical angle, and the ratio which the line bisecting the vertical angle has to the difference of the segments of the base," are given, the construction is proved by Mr. Swale to hinge on a case of determinate section. When "one side an adjacent angle, the area, &c., of a quadrilateral," are given, the construction is reduced by the same author to a case of the section of space; and he received the "prize medal" for solving question 240 in the old series of the *Repository*, which contains several properties relating to the curious, and then little known, subject of porisms. In the *Leeds Correspondent*, the *Companion*, and other periodicals, we might point out other instances in which the tangencies, the inclinations, &c., are evolved from data, which at the outset contain no visible traces of any such close connection with these noted problems. All cases of this description ought to be excepted from those to which the preceding objections more particularly apply, since they obviously exercise the powers of the student, at the same time that they add to his knowledge of the ramifications of the leading problems of the ancient geometry. We may add, that when any proposed question had been reduced by analysis to a case of these "second elements," the Greek geometers were accustomed to consider it as sufficiently solved, and the moderns have generally followed their example in this particular. As an illustration of the method of considering a problem relating to the construction of a triangle, we may select the following from the very elegant *Lucubrations in Mathematics*, by the late Colin Campbell, Esq., of Dingle Mount, Liverpool, in which the analysis, construction, and demonstration are given at length.

PROBLEM.

"Given the sum of the sides, the vertical angle, and the length of a line drawn from one of the angles at the base, to divide the opposite side in a given ratio; to construct the plane triangle.

ANALYSIS.

Let ABC *(fig. 3)* be the required triangle, and AD the given line, dividing in D the side BC, which produce to E, making CE = AC, and join AE; draw BH parallel to AC, meeting AD produced in H, and O,

R, being the centres of circles described through ADE, DHB, demit OF, RG, perpendicular to EB, and OI to RG. Then CD : DB :: AD : DH, which is therefore given, consequently the circles AED, DBH, are given; therefore OR (joining their centres) is given, as is also OI = FG = ½ EB; hence the angle IOR is given, wherefore IO, and thence EB, being parallel to it, and passing through the given point D, is given in position.

CONSTRUCTION.

Make the third datum AD : DH in the given ratio of the segments into which one of the sides is to be divided by AD, and on opposite sides of AH, describe DBH, AED, segments of circles to contain the given vertical angle, and its half respectively; join O, R, the centres of the circles, and on OR describe a semicircle, to which apply the chord OI = half the given sum of the sides, and parallel thereto, through D, draw EB, in which take DC : DB :: AD : DH; and having joined AC, AB, ABC will be the required triangle.

DEMONSTRATION.

Join AE, and draw IR to cut EB in G; on EB demit the perpendicular OF; and because DC : DB :: AD : DH; AC is parallel to BH; consequently the angle DBH = ACB = the given vertical angle by construction. Also since the angle ACB = CAE + AEC = 2AEC by construction, the angle AEC = EAC, therefore AC = CE, and, consequently, AC + CB = BE = 2FG = 2OI."

Q.E.D.

When considering geometrical problems it frequently serves a useful purpose to examine the *number* of solutions of which they are capable, as well as the *limits* within which they are possible. The latter is by far the more difficult inquiry; for the process sometimes requires a greater amount of skill and sagacity than the analysis of the original problem. On the other hand, we are amply compensated for the extra labour by the discovery of a multitude of beautiful properties relating to the *maxima* and *minima* of the quantities under consideration. If, for instance, it were required "to draw through a given point a parallel to a given right line, there can only be *one* solution possible; but if we had a given point, and were required "to draw a tangent from this point to a given circle," there would obviously be *two* solutions to the problem. We may, in general,

draw *four* common tangents to two given non-concentric circles, and we find no fewer than *eight* different solutions to the general problem of describing a "circle to touch three given circumferences." If, however, we had "to construct an isosceles triangle on a given base," or "to describe a circle through two given points," we have evidently too few data in each case to limit the problems, and the solutions therefore become *infinite* in number. Such problems as admit of a certain number of solutions are styled *determinate*, whilst the name of *indeterminate* is applied to those which can be satisfied by an unlimited number of solutions. When the object of inquiry relates to the position of a point, and it is found that an infinite number of points can be assigned, each of which satisfies the requisite conditions, the line traced out by these points is termed a *locus*;—if we "make the construction of the figure a part of the hypothesis, we have what was called by the ancients a *local theorem*; and, again, if, in enunciating this theorem, that part of the hypothesis which contains the construction be suppressed, the proposition arising thence will be a *porism*." (*Playfair on Porisms, Edin. Trans.* vol. iii. p. 171.)

The locus of the vertex of the triangle, and of the centre of the circle, in the instances just adduced, are obviously the perpendicular bisectors of the base, and of the line joining the two points; the loci of the vertices of all the equal triangles which can be constructed on the same base, and of all triangles having the same base and equal vertical angles, are a straight line and a circle respectively; and most propositions of this nature might be transformed, if necessary, into their corresponding local theorems and porisms by adhering to the preceding instructions. "Every indeterminate problem," says Mr. Potts, in his excellent edition of Euclid, "containing a locus may be made to assume the form of a porism, but not the converse, for porisms are of a more general nature than indeterminate problems which involve a locus."

It is, however, to the utility of *loci* in the construction of geometrical problems that we would now more particularly direct attention. If it were required to "determine the locus of all points from which tangents drawn to a given circle shall contain a given angle," an easy process will show that *any* point of a certain circle, concentric to the given one, will possess the property required;—and the *use* of this locus becomes at once apparent when "two circles are given, and a point is required from which

tangents to the circles shall contain given angles;" for the intersections of the two circles corresponding to the preceding locus in each case will evidently give the positions of the points answering the conditions of the problem. When the base and vertical angle of a triangle are given, the locus of the centres of the inscribed and escribed circle touching the base is well known to be a circle, whose centre bisects the arc subtending the base, and whose radius is equal to the chord of half the same arc, and this locus is of constant use in the construction of problems relating to the data of Halley's Diagram. Many other simple loci are equally efficacious, and much advantage may always be gained by availing ourselves of their intersections amongst themselves, or with the other data, whenever they are found to occur in the analysis of a problem. An instructive instance of this will be found in the solution of the following question, which, besides being possessed of some historic interest, recommends itself to the notice of the student by the variety of methods which may be adopted for its construction.

Problem.

Place a triangle, similar to a given one, so that its angular points shall rest upon the circumferences of three given concentric circles.

Analysis.

Suppose the problem solved:—ABC (fig. 4) the required triangle; O the common centre of the three circles; OA, OB, OC, their radii respectively. Take any point m in OA; draw mn, mp, parallel to AB, AC, and join np. Then, since the triangle m n p is similar to ABC, it is given in species, and by reason of parallels we have,

$$\begin{aligned} AO &: BO :: mO : nO \\ AO &: CO :: mO : pO; \text{ whence} \\ mO &: nO \text{ and } mO : pO \text{ are given ratios.} \end{aligned}$$

But when two points and the ratio of two lines drawn from them are given, the locus of their intersection is a given circle, and, consequently, the point O is at one of the intersections of two given circular loci. Hence the following

Construction.

Make the triangle m n p similar to the given one, and determine the point O by constructing the two circular loci corresponding to m n, m p,

and the given ratios m O : n O, and m O : p O, respectively. Join O m, O n, O p, and prolong them until they are respectively equal to OA, OB, and OC. Lastly, with these radii describe the three concentric circles, join AB, AC, BC, and ABC will be the triangle required.

The *Demonstration* is obvious from the Analysis. Particular cases of the general problem of "placing a triangle, similar to a given triangle, so that its angular points shall lie upon three circles anyhow given in position and magnitude," have frequently occupied the attention of English geometers. Mr. William Wales considered one of its cases, when engaged in observing the transit of Venus, on the shores of Hudson's Bay, in 1768, and other varieties were noticed by Professors Wallace and Davies in the *Repository*, and in the *Gentleman's Diary*. Mr. Swale constructed and demonstrated the case just considered as question 229 in the *Leeds Correspondent*; and Mr. William Shepherd, of Bradford, has recently supplied an elegant discussion of the most general case of the problem in No. 1617 of the *Mechanics' Magazine*. For the sake of comparison we may append Mr. Swale's construction adapted to the preceding diagram.

CONSTRUCTION.

"Let m n p be a triangle similar to the given one, and O the centre of the given circles OC, OA, OB. Draw any radius OC; make the angle OCP = m n p, and OC : CP :: n p : n m; to the circle OA apply AP, so that n p : n m :: OB : AP; draw CA, CB, AB, making the angle ACB = PCO : — the required triangle is ACB." (*Leeds Correspondent*, vol. iii. p. 286.)

It remains to assign the *limits* of the problem. Since the loci intersect twice, there will in general be two distinct solutions; but when the circles *touch* at O, only one solution is possible; lastly, when the loci neither cut nor touch, the problem becomes impossible. When two of the given circles coincide, the construction and solutions remain the same as before; two of the angular points of the required triangle lie on one circumference, and O is determined by the intersection of a straight line and a circle;— but when all the three circles coalesce, the problem admits of no more than one solution, since the loci then become straight lines, and O is determined by their intersection.

We have previously remarked that the Greek geometers did not consider

any proposition as completely solved until they had examined every particular case and determined the limits within which the theorem or problem under consideration was possible. The determination of such limits constitutes what is now known as the doctrine of maxima and minima. "Such propositions," says Mr. Potts, in his *Appendix to Euclid*, "as directly relate to maxima and minima may be proposed either as theorems or problems. For the most part, however, it is the more general practice to propose them as problems; but this has most probably arisen from the greater brevity of the enunciations under this form. When proposed as a problem there is greater difficulty involved in the solution, as it is required to find the limits with respect to *increase* and *decrease*, and then to prove the truth of the construction; whereas in the form of a theorem the construction itself is given in the hypothesis."

In many of the more simple instances, however, it is possible to infer the maximum and minimum cases without a formal process. Thus in *Euclid* i. 22, the *minimum* case is, obviously, that when the sum of the sides exactly equals the base, and at this limit the problem ceases to be possible; also in *Euclid* ii. 5, the magnitude of the rectangle is easily seen to vary from zero to the *maximum* when the two segments are equal to each other; and again in *Euclid* iii. 7-8, we find the *maximum* and *minimum* cases on the lines passing through the centre, whether the given point lies within, on, or without the given circle. When two points and a straight line are given in position, the sum of two lines drawn from the given points to intersect on the given line will be a *minimum* when they make equal angles with that line; but if a circle be substituted for the line, the *minimum* takes place when the lines make equal angles with a tangent applied at the point of inflection, or with a diameter drawn to the same point, and the case of the *maximum*, or when the sum of the lines is the greatest possible, occurs under the same conditions at the opposite extremity of the diameter. The demonstration of all these properties is very easy when they are enunciated as theorems, nor do some of them offer much more difficulty even when proposed as problems. Such, however, is not the case when we have given two points and a circle, and it is required to determine a point in its circumference, such that the sum of two lines drawn from the given point to the required point shall be a minimum; for we thus transform one of the foregoing easy cases into "Alhazen's Problem," whose solution requires the aid of the conic sections, as has

been shewn *algebraically* in the *Philosophical Transactions (Hutton's Abridgment*, vol. viii.), by Huyghens, Slusius, and Catalan; and more recently by an elegant *geometrical process* in the appendix to Dr. Simson's *Sectiones Conicæ*, of which a translation exists in the MS. remains of the late Mr. Colin Campbell.

Maxima and minima cases of problems may also be very frequently detected by examining all the possible variations amongst the data when the problems are constructed for a *given* quantity, and numerous examples of this procedure might be selected from almost any of our mathematical periodicals. If two points and a straight line be given, and it were required to draw two lines from the given points to the given line, so as to form a given angle, the intersection of the line with the segment of a circle capable of containing the given angle, will, in general, determine two points which satisfy the conditions of the problem. When these two points of solution coalesce, the given line becomes a tangent to the circle, and the *maximum* angle is formed at the point of contact. In other instances the *minimum* case is derived with equal facility; but the following example, furnished expressly for this paper by Mr. Henry Buckley, of Wood House, Delph, will render any additional illustrations unnecessary.

Problem.

"Having two points PQ, and a circle (O), given in position and magnitude, it is required to draw a tangent BC to the circle, so that if perpendiculars PB, QC, be demitted upon it from the given points, m.QC + n.PB may be equal to a *given* line, a *maximum*, or a *minimum*.

Construction.

Divide PQ at A (fig. 5). in the ratio of m to n. With centre A and radius AG $= \frac{1}{m+n}$ the given line, describe an arc HI. Draw the common tangent BLGC to touch the arc and the given circle in G and L respectively, and it will be the one required.

Demonstration.

Demit PB and QC perpendicular to LG, and draw QE, AF parallel to BC, meeting AG and BF in E and F. Then m.QC + n.PB = m. GA — m. AE + n. GA + n. PF. But by construction and similar triangles we have m : n : : AP : AQ : : FP : AE. Or, m. AE =

n.FP ; $\therefore$ m.QC + n.PB = m.GA. + n.GA = (m + n) GA = the *given* line as required.

When AG passes through the centre O, as in fig. 6, and the tangent is drawn at the extremity G of the diameter, m.QC + n.PB will evidently be a *maximum*, since, by *Euclid* iii. 8, AG is then the greatest possible.

Similarly the *minimum* case occurs when the contact takes place at G′, for then, *Euclid, ibid*, AG′ is obviously the least possible ; and the problem is evidently impossible when AG, or AG′, neither cuts nor touches the circle (O)."

Q. E. D.

We have thus endeavoured to point out and illustrate a few of the leading characteristics of the ancient geometrical analysis. The subject is undoubtedly an attractive one to all lovers of pure geometry, and might be pursued to much greater length with reference to porisms, poles and polars, radical axes, anharmonic ratio, conjugate division of lines, &c., &c. ; most of which have been treated, more or less extensively, under somewhat different forms by the Lancashire geometers. The writings of Playfair, Wallace, Davies, Mulcahy, and Chasles, may, however, be referred to in default of such an extension, since enough has perhaps been done to direct attention to a branch of science which has held its place in a course of liberal education for upwards of 2,000 years. Its prosecution, beyond the mere *Elements of Euclid*, and a few easy deductions, has for some time been mostly abandoned for the more powerful coordinate methods, and the gigantic strides which both pure and applied mathematics have made in our own times would seem to justify the change.

We may, however, conclude by observing, in the words of Dr. Whewell (*Liberal Education*, pp. 29-30), that " wherever mathematics has formed a part of a liberal education, as a discipline of the reason, geometry has been the branch of mathematics principally employed for this purpose. * * * It is not too much to say that it is a necessary part of a good education. There is no other study by which the reason can be so exactly and vigorously exercised. In learning geometry the student is rendered familiar with the most perfect examples of strict inference ; he is compelled habitually to fix his attention on those conditions on which the cogency of the demonstration depends ; and in the mistakes and imperfect attempts at demonstration made by himself and others, he is presented with examples

of the more natural fallacies, which he sees exposed and corrected. He is accustomed to a chain of deduction in which each link hangs from the preceding, yet without any insecurity in the whole; to an ascent, beginning from solid ground, in which each step, as soon as it is made, is a foundation for a further ascent, no less solid than the first self evident truths. Hence he learns continuity of attention, coherency of thought, and confidence in the power of human reason to arrive at the truth. These great advantages, resulting from the study of geometry, have justly made it a part of every good system of Liberal Education, from the time of the Greeks to our own."

This extract must form our apology to those who think lightly of mathematics as an exercise for the reasoning powers, for having treated so much at length upon the oldest, yet classical, forms of a favourite science. Pure geometry has ever been a leading feature in the writings of those mathematicians who have resided in the district which the Historic Society peculiarly claims as its own, and hence it may be presumed that a notice of the tendency of their scattered labours cannot be unacceptable in the pages of its transactions.

ON BABYLON;

AND ON THE DISCOVERY OF THE CUNEIFORM CHARACTERS, AND THE MODE OF INTERPRETING THEM.

By Dr. Julius Oppert,

MEMBER OF THE FRENCH SCIENTIFIC EXPEDITION TO BABYLON.

(READ 13TH MARCH, 1856.)

In attempting to convey my sentiments to a Learned Society in England, I must request the members to bear in mind that I express myself in a language that is not my own. I have long known, however, the extent of British hospitality towards strangers, as well during a long residence in the East as afterwards at their domestic hearths. This knowledge dissipates a great deal of the timidity and justified-hesitation with which I should make the attempt; and renders easier the task which I have set to myself, though it is still difficult.

I was appointed by the French Government to be a member of the scientific expedition to Babylonia. Our party was composed of M. Fresnel, the well known Arabic scholar, (who was brother to one of France's worthies, M. Augustine Fresnel,) of M. Thomas, a distinguished architect, eminent at the French Academy of Rome, and of myself. I shall have the honour to lay before you some of the results which we obtained, and afterwards to give some account of the state of cuneiform knowledge. I began the study of this subject in Europe, and afterwards continued it, with better materials and more success, in Babylon itself.

Besides the excavations which we had to undertake, we had been directed to survey the whole theatre of our explorations, and this department was undertaken by me. I spent nearly two years on the site of Babylon; and covered, with a netting of triangles, more than five hundred British square miles. I have been fortunate enough to find, in every instance, the true situation of Babylon corresponding with the territorial necessities; and in conformity also with the hints transmitted to us by the Holy Scriptures, by the Greek authors,—particularly Herodotus, Diodorus, Strabo, and

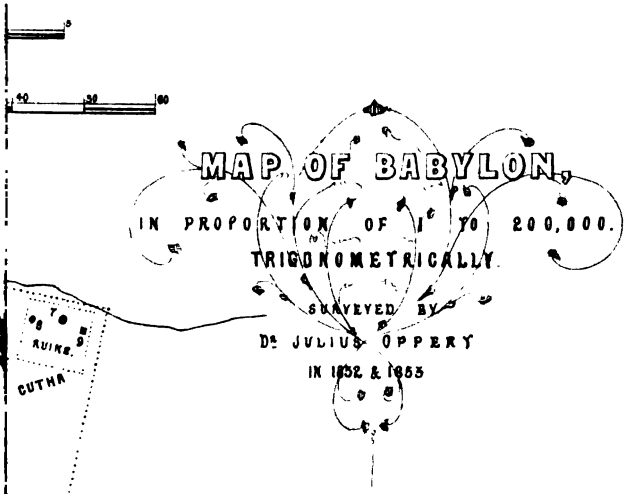
Curtius,—by the Babylonian Talmud, and by the cuneiform inscriptions, so far as their contents may be considered as satisfactorily known.

By the most simple means, I was successful in discovering the old Chaldean and Assyrian measures of length; and that discovery has been solemnly sanctioned by the illustrious Boekh of the Berlin Academy, who is justly regarded as one of the highest authorities on ancient metrology. Having observed the singular fact that all Babylonian square bricks are of the same size, and also that the whole of the stone slabs present a separate identity of magnitude, I measured 550 bricks and all the stone slabs I could find, with the utmost accuracy. I found that the side of the brick-square was to the side of the stone square, as *three* to *five*. The former being 0.315^{m} in length and the latter 0.525^{m}, the side of the brick-square was obviously the Babylonian foot, and that of the stone square a Babylonian cubit; and by a surprising but not fortuitous coincidence, the latter corresponds exactly with the Egyptian cubit. I found that the Chaldeans had a greater measure of 360 cubits, or 600 feet (*ammatgagari* in the inscriptions); and this greater itinerary length was the stadium of the Chaldeans. It was 189 French metres, 610 English feet, or only 14 feet longer than the Olympic stadium.

Both Nebuchadnezzar and Herodotus assign to the circuit of the walls of Babylon a length of 480 stadia; each side of the square must therefore have been 120 stadia, that is 22,680 metres or 14 miles. My trigonometrical surveys have, in the most satisfactory manner, proved the truth of my reckoning.

The great East India House Inscription of Nebuchadnezzar affords us another confirmation. The destroyer of the Salomonian temple says that his city covered a surface of 4000 *makhargagar*. The *makhar* is a square of 60 Chaldean feet in the side; the *makharyagar* 360 of those unities. The statement of Nebuchadnezzar is thus to be expressed by 5184 millions of square feet, what everybody may verify; and exactly the surface of the great square, the side of which was 72,000 feet.

Babylon filled thus a space of 514 kilometres, or almost 200 square miles. But this huge surface was not all inhabited; in the exterior enclosure, made by Nebuchadnezzar, were contained immense fields, which in the case of siege provided the city with corn and protected her from the horrors of famine. This exterior wall is said to have been destroyed



REFERENCE

1. BABEL OR MUJELIBEH.
2. KASR. PALACE OF NEBUCHADNEZZAR.
3. AMRAN-IBN-ALI. HANGING GARDENS.
4. QUAY OF NABONIDUS.
5. MINOR PALACE (RESIDENCE OF ALEXANDER)
6. RUINS NAMED-EL-HOMEYRAH
7. OKEIMIR
8. EL-KHASNEH (THE TREASURE HOUSE)
9. BENDER.
10. BIRS-NIMROUD.
11. IBRAHIM-EL-KHALIL
12. MESHHED-ES-SHEMS (SUN TEMPLE)
13. EL-KOLAIEH (TEMPLE OF MYLITTA)

by Darius, when he took Babylon. But there were, in the inside of that great circumvallation, five other walls, as the most important of the Babylonian writers, Berosus, assures us; and this statement is confirmed by the Babylonian inscriptions. If we call the first, or outer wall, A, the next concentric circumvallation may be termed B. This was a square in the same direction as A, but only of 360 stadia, (ten miles to a side). Concentric with this was a third, C, that enclosed the real city of the Babylonians, situated at the very spot of the town Hillah. This town was built in the eleventh century, when the Euphrates, which since the fifth century of our era had taken another direction, re-entered his old Chaldean bed. It is the custom of the oriental people to settle on ruins; so that most of their cities, and all their *Kubbets* and worship places, occupy the sites of more ancient buildings. The Muhammedan city of Hillah was built from Babylonian materials, and I dare say there is not a single room where a brick might not be seen stamped with the name of Nebuchadnezzar. The new settlers fixed upon the spot of Babylon and no other, for the very reason that materials were ready at hand for new colonists.

The real city of Babylon, C, was of a very limited extent; it was about as large as the part of Paris on the left bank of the Seine. Its boundaries are clearly indicated by old canals, that ran round in the direction of the two outer walls. I believe it to cover a surface of 4½ square miles. Thus the city of Babylon may have had, I fancy, almost 300,000 inhabitants; while the whole population of the great Babylonian metropolis may have amounted to not less than a million.

The interior wall, B, is the second wall of Herodotus, and enclosed the inner city (ἔνδον πόλις), amounting to an extent of 110 English square miles; but besides this proper wall, the area within it contained the most important ruins of Babylon, the royal city, surrounded by a wall, D, of sixty stadia, which exists to the present day in almost its entire length. The reason of its preservation is very simple. Long after the Chaldean empire, the Parthian kings residing at the neighbouring Seleucia, made of the Babylonian palace gardens a hunting ground; they had, therefore, the walls restored to keep the prey properly secured. The other walls disappeared, and for a very simple reason also. The fortifications being built from the earth of the surrounding districts, protected only by a weak brickwork, they fell down into the canals from which they had been taken,

as soon as the bricks were pulled out for the purpose of being used elsewhere.

The whole of the remains of the surrounding walls, however, (A, B, and C,) could not be destroyed; and I have incontestible proofs both of their position and direction, in some Babylonian mounds. In making my surveys I ascertained that a straight line was formed by three hills, in the direction of 10° N.E. and S.W. Their names are, Tell Ghazaleh, Tell Schetiteh, and Tell Zawîyeh, and they are distant from each other about two miles. Far from these I observed a range of hills, in length about six miles, and in the direction of 80° N.W. and S.E. It cuts the former range at a right angle, and the point of intersection is the Tell Zawîyeh, whose name signifies in Arabic, *corner-hill.* This coincidence could not be fortuitous. I saw at once the perpetuation of the historical fact, that the north-west corner of the inner wall B of Babylon had been at this spot. Long afterwards, I found that a range of tumuli, in which the most prominent are named Tell Harkeh and Tell Seid, are just in the direction of 10° N.E. and S.W., and parallel to the western corner-hill range. Having the corner of a square and two opposite sides in position, it was not very difficult, of course, to complete the figure; and, to my great gratification, all subsequent discoveries contributed to corroborate this deduction.

I have now spoken of the walls A, B, and C. It remains to notice the three others. In the north of the Babylonian city, situated between the concentric walls B, C (πολις), was the royal city (βασιλεία), and distinctly separated by Arrian from the former. The wall that surrounded it on both sides of the river is still existing in parts, and agrees most accurately with the notices which are taken of it by Herodotus, Ctesias, and Diodorus. All modern writers,—as Niebuhr, Rich, Ker Porter, and Fraser,—have seen in this the ancient royal city; and they are right. Only Rennell, whose views have, I believe, been adopted by Sir Henry Rawlinson, sees in that part of Babylon the whole town; but his opinion has been already refuted by Rich. Notwithstanding the respect due to these two gallant officers, I am always asking myself how Rennell and my illustrious friend Rawlinson explain the testimony of Herodotus, Ctesias, Berosus, Clitarchus, Diodorus, Strabo, Arrian, Philostratus, Athenaeus, Pliny, Curtius, Plutarch, and other more modern writers; whose remarks are all corro-

borated by the discovery of the inscriptions, and by the most eloquent speaker—the ground itself.

The royal part of Babylon, which is two and a half square miles in extent, contains, from north to south, the following:

(1) The ruin Babel, an ancient temple of the lord of Gods, Merodach; afterwards a fortress, attacked in vain by Demetrius Poliorcetes.

(2) The ruin Kasr, the royal residence of Nebuchadnezzar.

(3) The ruin Amran-Ibn-Ali, the hanging garden of Babylon.

We found in 1853, when the waters of the Euphrates had sunk to a formerly unknown level, a large construction in the water; and we were able to trace its course for about three miles. The inscriptions on the bricks composing that gigantic work clearly proved it to be the quay of Nabonidus, mentioned by Berosus We had, therefore, a new proof that the river in the period of the Chaldeans flowed as it does in our own time, (some fluctuations excepted,) and that it never went out of its bed in the very singular manner that Major Rennell was obliged to suppose, in order to explain a mis-understood passage of Diodorus. Rennell interpreted the passage as if the Sicilian writer had said that the palace was on the western, and the tower of Belus on the eastern side. He took Babel for the latter and the Kasr for the former, and was thus obliged to admit that the Euphrates, in the Chaldean epoch, flowed between these two ruins. This opinion is a mistake; and, moreover, the Greek author did not say so, but stated actually that the palace was on the side of the Euphrates looking towards the west, that is, on the oriental side in Mesopotamia, while the tower was on the opposite side in Arabia.

In the zone between the walls A and B,—viz. the wall of 480, and that of 360 stadia,—were the two other parts of this great town of Babylon. In the N.E. exists a mound which may be seen from a great distance. Its name is Oheimir, and it is situated nine miles from Hillah. Here was one of the cities of Cuta, and I believe the mound in question to be the ruins of the temple of Nergal. Seventeen miles from this place, at the south-west, equally between the walls A and B, and almost in the diagonal of the great Babylonian square, is a much more interesting ruin, well known under the name of the Birs Nimroud.

Fraser and Ainsworth had already proposed the identification of these ruins with the place anciently named Borsippa; we found in 1852 the confirmation of that opinion, in a little clay cake brought from that place, and marked from Borsippa (Borsip). The Talmud believes Borsip to be the scene of the confusion of languages. I explained the meaning of the term "Borsip" a long time ago, as the *tower of languages*. This opinion is confirmed by the cuneiform writing itself; the name Borsippa is often written in an ideographic way, signifying city of the dispersion of tongues.

It is possible, but not at all proved, that this temple was consecrated to the *seven spheres*. This is Sir Henry Rawlinson's view, but I wished to translate the term the *seven lights of the earth god*. The cylinders found there by the learned Sir Henry, speak of other monuments restored by the mighty ruler, who rebuilt the ancient temples of his metropolis after he ascended the throne. It was also sacred to the god Auv, or U, the representative of intelligible light, who had a temple at Borsippa. Nebuchadnezzar says, this god "had the temple of prophecy made in my country;" and hence the story of the tomb of the god Belus. This light god was confounded by the Greeks with the god Belus: but the confusion was the more pardonable as all the gods had the epithet of "bel," or "lord." By all means, then, this temple of Borsippa is the temple of the Bel of Herodotus; and since the recent excavations of Sir Henry Rawlinson, more than ever. But it is not the temple mentioned by the better instructed Arrian, who spoke of the veritable temple consecrated to Belus, in the middle of the city of Hillah.

Borsippa was a suburb of Babylon; but it was a part of Babylon, just as Westminster is of London. King Sargon, in the inscriptions, speaks of his constructions at *Sipar, Nipur, Babylon;* or of the same at *Sipar, Nipur, Babylon,* and *Borsip;* and in the Assyrian inscriptions, at least, Borsippa never appears without Babylon. Nebuchadnezzar mentions the wall with which he surrounded the city of Borsippa, and this passage is to be found between those who speak of the inner and the exterior walls. The latter included, after the time of Nebuchadnezzar only, the formerly independent Borsippa. We see, in one word, the same phenomena,—of extension and absorption of more remote boroughs into the great metropolis,—which we have remarked during several centuries in almost all the capitals of Europe.

But the exterior wall having been destroyed by Darius, the borough of the "tongues-tower" became again separate from Babylon; and so we find it in Alexander's time, when the Chaldean city had only 360 stadia (40 to 42 miles) of circumference. The destruction of this gigantic circumvallation is the reason of the discrepancy between the Alexandrian writers and the father of history.

I could mention many other ruins, but I shall only speak of a little square mound, the forms of which are so regular, that it is called Mukhattat. It is situated out of Babylon, in a plain, which is named at the present day as it was in the days of Nebuchadnezzar, Dura. If there ever was a golden statue of this king, it was here on this spot; and the mound Mukhattat was its pedestal.

A more detailed account of Babylon, as it was, would be out of place here, however interesting it might be in general, to follow the steps by which, in successive centuries, it became what it is. Only permit me to add, that by a singular predestination, this city of Nebuchadnezzar became, for about a thousand years, a town of the Jews, who founded on the very spot of their exile, their most renowned schools. With the abandonment of the Jews in A.D. 1037 only, the very name of Babylon disappeared, and was replaced by that of the town Hillah; every stone of which attests its glorious origin. Thus fell Babylon, or rather, thus it died. It was deserted, according to the prediction of the Prophets; and when we consider what Babylon was, and what it is, we cannot deliver ourselves from the melancholy question, if a similar destiny should be reserved in time for our great cities. We hope not; and our hope finds its most mighty support in the consideration of a difference which I need hardly specify to a British audience, in the appreciation of European civilization, which on the very spots of Babylon and Nineveh seeks its lessons for humility, and which has revived the language and civilization of the Mesopotamian people, after they had been buried for two thousand years!

In my notice of Babylonian topography, I have several times referred to the cuneiform inscriptions; and you are of course entitled to inquire, whether this most mysterious form of writing is sufficiently known to afford a basis for historical and geographical research. I shall now reply to this question, in exposing, as succinctly as possible, the present state of our knowledge.

Before all else, Science is indebted for the rapid progress which cuneiform knowledge has made in our own time, to those courageous men who devoted themselves to the excavations of ancient Chaldea. After the first discoverer, Botta, it is M. Layard, to whom belongs the merit of having brought from the darkness to light, the most important documents. After him, I must name, of Englishmen, in the first place, M. William Kennett Loftus, whose diggings at Susa, Warka, and Nineveh have cast so great a light over that branch of ancient history. Great treasures were brought up by the efforts of M. Taylor, in Lower Chaldea, and M. Hormuzd Rassam at Nineveh; and I may close the names of excavators by one of the most successful, M. Victor Place, who, walking in the steps of his predecessor Botta, laid bare the great palace of king Sargon, at Khorsabad. These are the men who have furnished the bulk of the material on which the cuneiform scholars may work; and I may be allowed to trace also the names of those to whom Science owes the revelation of the epigraphic mystery of cuneiform knowledge.

The first and the most meritorious discoveries were made by the late Director Grotefend of Hanover; he is regarded as the first decipherer of cuneatic writing. It is unnecessary to enumerate the scholars who prepared the explanation of the Assyrian inscriptions by the previous interpretation of the Persian translations; I will only notice those who began the decipherment of the Assyrio-Chaldean writings. The exposition of the very genius of this figurative expression of human thought will show why the progress was so slow; why every pace forward had to be conquered by continuous and everlasting investigation.

The Assyrian documents would never have shed their light on the primordial history of mankind, they would never have corroborated the facts narrated in the Holy Scriptures, if the old Persian kings, rulers of Asia, had not felt the necessity of promulgating their decrees in three languages. One of these tongues was the old idiom of Xerxes; another, as I believe, that of Scythia; and the third was the language of Nineveh and Babylon. After the discoveries of Botta and Layard, several attempts were made to decipher the Babylonian transcript by the aid of the Persian translation. The first paper of M. Löwenstern on that subject was very insufficient; but those who followed him were more successful. Already in 1847, M. Adrien de Longpérier, now member of the French Institute,

read the first name of an Assyrian King; and in proving the name Khorsabad to be identical with the biblical Sargon, he has the merit of having closed the period of uncertain wavering about the age of Assyrian art. M. de Saulcy followed him in attempting for the first time to give the translation of a whole inscription. This first and courageous essay afforded to science statements which are not only certain but highly interesting.

Soon after, Dr. Hincks published his paper on the Khorsabad inscriptions, and, for the first time, proved the syllabical mode of Assyrian writing. By this discovery, he is evidently the man who has contributed in the largest degree to the decipherment of cuneatic inscriptions. Sir Henry Rawlinson was at first inclined to admit, like M. de Saulcy, the mere alphabetical character of the cuneiform writings; and he was already able to profit by the astonishing discovery of Dr. Hincks, when he published in 1851 the Assyrian text of the Behistun inscription. For this, science is highly indebted to his powerful penetration, his indefatigable courage, and everlasting activity. The document of the work of Behistun, although in a very mutilated state, is the most important clue that destructive time has yet allowed to reach our age.

Sir Henry Rawlinson also found a certain principle, the existence of which, indeed, nobody would have expected. He found that one sign in Assyrian might signify several sounds; and this peculiarity, which he designated by the name "polyphony," was so abnormal and so contrary to the very spirit and end of writing, that many people contested his conclusions, from that seemingly awkward principle alone. Yet he was right in adopting it, and I looked on this step as an act of scientific desperate resolution. I shall have the honour to give my explanation on this subject, and on this occasion, a glance at the scientific peoples of Asia.

There are only, according to my researches, two classes of cuneiform writing. These I name *arian* writing and *anarian*. The former is alphabetical, and contains only the Medo-Persic mode of writing. The latter is syllabic and ideographic; and the same writing served to express five languages, different each from the other, viz., Assyrio-Chaldean, Armenian, Susian, and two Scythian classes of languages. Our European alphabet, in like manner, serves to express a great many idioms. One of the cuneiform systems is more generally known under the name of the

second class of Persepolitan writing; the second and third are the same, but merely in different styles. M. Norris showed also the identity of forty-five characters, and I have ascertained the same thing in reference to forty-five others, of the so-named Scythic characters.

This writing was at first hieroglyphic; and I have found nearly twenty of the characters derived in form from the very images of the objects which they severally expressed; but as it occurred naturally, the ideographic writing became in part syllabic. Now, five languages use the same syllabic and the same ideographic images. It is clear, for example, that when in the Susian and Assyrian languages the *syllabic* sound *an* is represented by the same sign, the Susians and Assyrians will agree in giving to it the same pronunciation. But while this same character represents also the ideas of *star* and *God*, it is likewise evident that it could not in that case have the same pronunciation in the two countries.

It is evident, on the other hand, that one people must have invented this kind of writing, and have transmitted it to the other. The disciple-nation took not merely the idea inherent in the sign, (as *God*, or *star*,) but also the syllabic value that expressed the idea of the master-people. But that value was not sufficient for the second language to explain the idea, and, therefore, the latter people were forced to adopt a new value for the character. This lingual transmission, by one nation to another, explains the very singular fact of the polyphony.

This variety of sounds, related to a single character, is moreover explained by the hieroglyphic origin of cuneatic writing. An image can only represent a visible object; but how did people express abstract notions? Everybody will answer, with us, by a symbol; thus strength may have been represented by the figure of an arm, royalty by a sceptre, and so on. Thus you will not be astonished that one sign had often several meanings, one concrete and several abstract. We know by M. Layard's documents that actually the ideas of "brother" and of "protecting" were expressed by the same ideographic character. In a similar manner, the notion of "light" represented equally the two verbal ideas of "warming" and "engendering;" that of "town" replaced the verb "to multiply," exactly as the Sanscrit *pura* "town," and *puru* "many," or the Greek πόλις and πολυ derive from the same radical.

Not only the direct notions expressed by the image, but also the derived ones, were transmitted, with their respective sounds, by the first inventors to their disciples.

A highly interesting ethnological inquiry is, What people first invented this kind of writing? Everything goes to prove that it was not the Assyrio-Chaldean people. In a lecture which I delivered some time ago, before the Académie des Inscriptions et Belles Lettres at Paris, I had the honour to prove that it was the people who spoke the language of the second species of Achemenian writing, and that this idiom was a relative to the Scythic of Herodotus. From many facts, indeed, we acquire a conviction that there existed a Tartar civilization in Asia, before the Semitic and Arian conquests. We have not leisure to enter into the discussion of this subject at present; I will, therefore, only lay before you a complete syllabarium of the anarian language, as complete as the present time admits of.

I should, however, be glad to say a few words about the present state of our knowledge on that subject. We understand now many passages of the historical inscriptions, and we may determine the sense of many others; but in almost all cases it is extremely difficult, if not impossible, to prove demonstrably the true meaning. We have not yet arrived at a very high degree of knowledge of the language; and though the decipherment may be considered as almost finished, the great question is the interpretation of the documents, which are truly transcribed and pronounced. Or, we must have the courage to admit our ignorance, and not fear the words *γνωθί σεαυτον*. We must avoid making illusions to ourselves on that subject; and, in the very interest of science, not wish other people to believe that we know more of these things than we do. It is already a very great thing, it is an enormous fact, that we look into these questions as we do; and this decipherment is really one of the triumphs of modern science. We have, therefore, a right to claim indulgence.

The documents of which I am speaking corroborate the facts of the Bible, and sometimes they contradict them, for the Assyrians, like ourselves, were subject to error. When there is a contradiction, people say that it is an argument against the correctness of the decipherment. When king Yehu is said on the obelisk of the British Museum to have been the son of Omri, you should not attack the man who reads what is written, but the

man who wrote it. It is not we who are mistaken, but the Assyrians who were so in their statements on Jewish matters.

I shall now, in conclusion, give some examples of the inscriptions; and I shall commence with the shortest. M. Loftus found amid the ruins of the palace of Sardanapalus, some images of dogs, and on these dogs were written the names which the Assyrian monarch gave to them. The manner in which I explain the words, confirms, I fancy, both the readings and the explanation. One dog is named *Munashiku garishu*, [he bites those who excite him]; another *Dan rigishshu* [the leader of the pack]; a third *Kashid aibi* [grasping the enemy]; and a fourth *Mushissu shilikat?* [exciting the grey-hounds?]

The proper names on the cylinders have also been explained; out of the mass, I will only mention here the cylinder of a Jew, which is now in Paris. He was named *Abshalum*, and was the slave of a Chaldean; the cylinder is apparently the seal of a Babylonian captive.

I cannot refrain from noticing the extreme difficulty there is in reading the names of Assyrian kings, from their being written in monograms. Nothing is easier, indeed, than to decipher a foreign name in the cuneatic inscriptions; but nothing also, I dare say, is more troublesome than to assimilate an Assyrian king to a monarch known either from the Bible or from the Greek authors. There is a name common to several Nineveh kings composed of three signs which I read *U-likh-khus*, and in which I see with Sir Henry Rawlinson the prototype of the Greek Belochus. This name was borne by the seventh and twelfth descendants of Belitaras, founder of the second dynasty. The latter Belochus is identified with the biblical Pul by my illustrious friend, but I regret to say, that as well chronological as historical reasons forbid me to adopt his views. The Pul of the Bible was an usurper, but the Belochus of monuments, the husband of Queen Semiramis, a very legitimate king. One was Babylonian, the other Ninevite. One was called Pulli, the other Ulikhkhus. I dare say that Dr. Hincks shares completely my chronological views on Sir Henry's system. I even owe to the Irish scholar the cognizance of the most decisive facts on that subject. I may add, that the last pronunciation, *Pulukh*, proposed by the eminent interpreter of the Behistun inscription, is as little satisfactory as the readings adopted by him precedingly, viz.,

Hevenk, Adramelech, and Pallukha. I think, we may without any difficulty prove, that this name cannot be read *Pulukh;* and I feel myself authorized to oppose to the identification of the twelfth descendant of Belitaras with the biblical Pul, the most absolute and the most decisive denegation.

In order to give an idea of the Assyrian style, I shall now produce the translation of some fragments written on the Sargon cylinder, from Khorsabad.

> "Sargon, formerly Belpatisassur, worshipper of the god Ashur, keeping the mysteries of Oannes and Dagon, great king, mighty king, king of legions, king of Assyria, king of the four countries, creature of the great gods, slave of the existent being, to whom Assur and Merodach allowed the empire of nations, recording his name, compelling to war against wickedness. Who made the Mole of Sippara, Nipur, and Babylon, favourable to their inhabitants, obedient to their wisdom; fuller of the clothes* of the Phalgi.....forcing to contribution the tribes of Israel, transporting their population.....Who from the commencement of his reign spared not the kings his enemies, who never saw rest from battle and fight, who crushed like *hesbet*† the lands and their rulers; the four cardinal points were arrosed with blood. The fields and the castle in their subjection I took them. I saw their destruction. I the king who ruled from Ras under the dominion of Elymais, Bucud, Daman, Hisrigalzi, the town of Rapik, the land of Amutsabi(?), to the boundaries of Egypt, Aharri [Phenicia] the mother of the Hittites. From the land of Khashmar to the town of Simaspatti in the remote Media, at the rising of the sun; from Scythia, Albania, Bit Ham Can, Parthia, Van, Ararat [Armenia], Colchis, Tubal, to the Moschi reached the power of his arm; he constituted over them magistrates, and other people, and imposed on them tributes like to the Assyrians: the just, the strong, who transported Israel into knighthood, who vanquished Humbanigas, king of Elam and the Namruma..... who attacked the house of Omri with force, who defeated Egypt at the town of Raphe;

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* A talmudical expression for King. It is quoted in the talmud and explained by "King."

† The blue face-paint.

Hanan king of Gaza, his ally, he brought to Assyria; attacking the Tamudeans, Ibadid, Warsimani, Hayapa.....cheating the sense of the house of Omri, captain of the vessels which crossed like fishes the sea of Ionia with courage, transplanting the land of Kui and Tyrus.....who tried Bit, Burutash the king of whom Ambarissi doubted of the power of Sargon, they trusted to Armenia and the Moschi; they were humiliated entirely;—who punished Mita king of the Moschi, and who took with him the spoils of the land of Kui.....who declared war to Armenia, plundered the city Mussasir that Ursaha king of Armenia, in his great deference in the service of his superiors..... .....sweeping away Andia, Zikartu, the people of whom I slew entirely; in the lands of my enemies rushed the terror of death.....I have taken the land of Media without tax, I have taken the people of Kharkhar, I have enlarged the empire of Assyria."

The king continues then in the enumeration of some other reduced nations, and speaks afterwards of the building which he erected in the tower of Hisri Sargon, which he named after his name, and which is the modern Khorsabad. I omit those most difficult passages. I shall only speak of the doors which he built, because here the actual excavations confirm our reading and translations.

"I made, in the direction of the four cardinal points, eight great doors.* The god Shamash [the Sun] lets me take my possession; the god U creates my..... the great door of the god Shamash and the god U, I named thus the door on the side of the East. Belus-Dagon found the reservoirs of my city, Taouth prepares in her bosom the stone of painting [fucus]. The great door of the South I consecrated to the god Belus-Dagon, and the goddess Taouth. The god Anu who finishes works of my land, the goddess Istar [the Moon] inflames its inhabitants. The great door on the side of the West I made to the god Anu and the goddess Istar. The god Nisroch directs the marriages of men, the goddess Belitilüi [Mylitta] prospers the births of men, I named on the North, the great door of Nisroch and of Mylitta. The god Assur gives victory to the standard of the kings who adore him (lit. "who make him"); he protects the army of their fortress. The god Ninip sets..... for long days give him the victory."

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* The cylinders say *eight*, the Bull inscriptions *four*.

After this, the inscription concludes as follows :—

> "The gods who inhabit heaven and earth and this city, have blessed all; they listened favourably to me while I invoked them, in building the town and in performing the holy rites. But he who infests the works of my hand, who defaces my pictures, who mingles the earthern jars of my treasury, who tears my clothes, that the gods Ashur, Shamash, and U, and the gods inhabiting his heart, may sweep away from this country his name and his family, and may calamities put him into the knighthood of his enemy."

It is only right to mention that of sixty-seven lines I have been able to translate but thirty-one. The remaining thirty-six are still a mystery to me, although I perceive their general sense.

I will now conclude with a short Babylonian inscription, remarkable because King Nebuchadnezzar is boasting to have "confounded the new lie," and we may easily infer what is the meaning. The destroyer of the temple of Jerusalem, blinded by his successes, styles himself 'the King who cannot be compared to any other,' and we may explain that by the words of the Prophet,* who warns the people that the promises of escape from the King of Babylon were all untrue. Here is the inscription :—

> "Nebuchadnezzar, King of Babylon, great, majestic, builder of Bitsaggata and Bitzida,‡ son of Nabopolassar, King of Babylon. I, I say,—Nabopolassar my father commenced the great walls of Babylon.....I dug out the trenches, and elevated highly its towers in bitumen and bricks. The god Merodach, great lord, strengthen my arm; we have confounded the *new lie;* accept graciously my prayer thou god; to this realm grant succession for remote days."

The interest which attaches to questions of this kind is steadily increasing, and this, I trust, will be a sufficient apology for entering into it as I have now done. And permit me also to add, that if these archæological studies are not of immediate practical utility, they are at least contributing to the

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* "Therefore, hearken not ye to your prophets, nor to your diviners, nor to your dreamers, nor to your enchanters, nor to your sorcerers, which speak unto you, saying, 'Ye shall not serve the King of Babylon,'—for they prophecy *a lie* unto you."—Jerem. xxvii. 9, 10.

‡ Two Scythic words explained in the syllabaria.

great work of civilization. I shall not speak here of scanty historical facts, such as lists of kings formerly unknown, and of whom we still know nothing more than the names; but of the general lessons given to our century by the entire revelation of such powerful civilizations as were those of Babylon and Nineveh. And if these scientific studies only served to show the exactness of the historical facts contained in the Holy Scriptures, would they not be of great importance? The present age, therefore, may not refuse to cast a glance back on its less privileged predecessors, which illustrate more clearly than we knew before, the primeval period of mankind.

ON THE METHOD OF TESTING MARINE METEOROLOGICAL INSTRUMENTS, RECENTLY INTRODUCED AT THE LIVERPOOL OBSERVATORY.

By John Hartnup, Esq., F.R.A.S.

(Read 17th April, 1856.)

It will probably be remembered that in the year 1853 a conference of maritime nations was held at Brussels, on the subject of meteorology at sea. The report of this conference was laid before Parliament, and the result was a vote of money for the purchase of instruments and the discussion of observations, under the superintendence of the Board of Trade. Captain Fitz-Roy, of the Royal Navy, an officer well known for his zeal and great practical experience in these matters, was appointed to superintend this new department of marine meteorology. Arrangements were made, in accordance with the views of the Royal Society and the British Association for the Advancement of Science, for the supply of instruments properly tested. A committee called the Kew Committee was appointed for this purpose, and the Kew Observatory was at first fixed on as the sole place for testing these instruments. Arrangements were, however, subsequently made for testing barometers and thermometers at the Liverpool Observatory; and it is a brief description of these arrangements, together with a few examples, the results of our experiments during the past few months, that I venture to hope may not be found uninteresting to the Scientific Section of the Historic Society.

In the barometers now in general use by meteorologists, the diameters of the tubes are nearly equal throughout their whole length, and a provision is made for adjusting the mercury in the cistern to the zero point, previous to reading the height of the top of the column. The object of the latter arrangement, it is well known, is to avoid the necessity of applying a correction to the readings for the difference of capacity between the cistern

and the tube. At sea, barometers of this construction cannot be used. The tube of the marine barometer must be very much contracted to prevent the "pumping," and the motion of the ship would render it impracticable to adjust the mercury in the cistern to the zero point. In the barometer usually employed on shore, the index error is the same throughout the whole range of scale readings, if the instrument be properly made. In nearly all the barometers which have till recently been employed at sea, the index correction varies throughout the whole range of scale readings, in proportion to the difference of capacity between the cistern and the tube. To find the index correction for the first-named barometer, a comparison with a standard at any part of the scale at which the mercury may chance to be standing, is generally considered sufficient. To test the marine barometer is a work of much greater labour, since it is necessary to find the correction for scale readings for every half-inch or so throughout the range of atmospheric pressure to which it may be exposed, and it becomes necessary for us to have recourse to artificial means of changing the pressure of the atmosphere on the surface of the mercury in the cistern of the barometer. The first successful attempt to do this was, so far as I am aware, made at the Kew Observatory by Mr. Welsh. In December, 1854, I saw the apparatus for accomplishing this object, in operation at the observatory above named; and the apparatus which we now have at the Liverpool Observatory is of a similar description, with such improvements as were suggested by Mr. Welsh, from his experience at the Kew Observatory.

The barometers intended to be tested, together with a standard, are placed in an air-tight chamber, to which an air pump is applied, so that by partially exhausting the air, the standard can be made to read much lower than the lowest pressure to which marine barometers are likely to be exposed; and by compressing the air it can be made to read higher than the mercury ever stands at the level of the sea. The tube of the standard is contracted in a similar way to that of the marine barometer, but a provision is made for adjusting the mercury in its cistern to the zero point. Glass windows are inserted in the upper part of the air chamber, through which the scales of the barometers may be seen; but as the verniers cannot be moved in the usual way from outside the chamber, a provision is made for reading the height of the mercury independent of the verniers attached

to the scales of the respective barometers. At a distance of some five or six feet from the air-tight chamber a vertical scale is fixed. The divisions on this scale correspond exactly with those on the tube of the standard barometer. A vernier and telescope are made to slide on the scale by means of a rack and pinion. The telescope is armed with two horizontal wires, one fixed, and the other moveable by a micrometer screw, so that the difference between the height of the column of mercury and the nearest division on the scale of the standard, and also of all the other barometers placed by the side of it for comparison, can be measured either with the vertical scale and vernier or the micrometer wire. We therefore possess the means of testing barometers for index error in any part of the scale, through the whole range of atmospheric pressure to which they are likely to be exposed, and our usual practice is to test them at every half-inch from 27·5 to 31 inches.

Upwards of seventy barometers of various descriptions have already been tested in this way at the Liverpool Observatory, and the errors are often found to be so large that, independent of the necessity for finding the corrections in order that the readings of different instruments may be compared with each other, the advantage is of no small importance to captains, as we meet with some barometers which read half an inch and upwards too high, and others which read as much too low. In some cases those which are correct in one part of the scale are from half an inch to an inch wrong in other parts.

It is a very common fault, in the construction of the marine barometer now in general use, that the cistern is not large enough to hold the mercury which descends from the tube in a low atmospheric pressure. We have met with some in which the mercury would not descend lower than about 29 inches, from the above-named cause; and it must be evident to any one, that such barometers are calculated rather to mislead than to assist the judgment of the mariner.

The practice which has for so long been adopted of mounting the marine barometer in wood is very objectionable; and the instrument recently introduced agreeably to the recommendation of the Kew Committee, is greatly superior to any other description of marine barometer which we have tested, as regards the accuracy with which it indicates the pressure of

the atmosphere. A description of this barometer is given in the Report of the Kew Committee to the British Association for the Advancement of Science, by Mr. P. Adie, the maker of the instrument. The barometer now exhibited is one of Mr. Adie's, with the various improvements which have been effected since its first introduction. The diameter of the cistern is about an inch and a quarter, and that of the tube about a quarter of an inch. The scale, instead of being divided into inches in the usual way, is shortened in the proportion of about 0·04 of an inch for every inch. The object of shortening the scale is to save the trouble of applying the correction for difference of capacity between the cistern and the tube. The perfection with which this is done may be judged of from the fact that of the first twelve barometers tested at the Liverpool Observatory with the new apparatus, the index corrections in the two pressures of 28 and 31 inches in three of them were the same; two differed 0·001 of an inch, and for the remainder the differences ranged from 0·002 to 0·006 of an inch. The correction for capacity may therefore be considered sensibly perfect; and there can be no doubt whatever of the practicability of correcting for capacity the standard barometers ordinarily used on land in the same way, and thereby doing away with the necessity of adjusting the mercury in the cistern to the zero point before each reading. The twelve barometers above alluded to were first tested at the Kew Observatory, and then forwarded to the Liverpool Observatory by the railway. At Liverpool they were tested again, in order to see if any change had taken place from the shake of the railway carriages in a journey of upwards of 200 miles. In six of the twelve barometers the index errors were found to be the same at Liverpool as had been given at Kew. Three differed 0·001, two differed 0·002, and one differed 0·005 of an inch. I think it will be admitted that this is a degree of perfection highly creditable to Mr. Adie, the maker of the new marine barometer.

In order to stop the pumping of the mercury at sea, the tubes of these barometers are so contracted, that when first suspended, the mercury is about twenty minutes in falling from the top of the tube to its proper level. When used on shore, this contraction of the tube causes the marine barometer to be always a little behind an ordinary barometer, the tube of which is not contracted. The amount varies according to the rate at which the mercury is rising or falling, and I have found it to range from 0·00 to

0·02 of an inch. At sea it is thought that the motion of the ship causes the mercury to pass so much more rapidly through the contracted tube, that the readings will be sensibly the same as they would be if the tube was not contracted. For stationary purposes, the tube need not be contracted, and this barometer will then be found to be a very perfect instrument. I saw one at the Kew Observatory nearly two years ago, which was made by Mr. Adie; and I have been informed that M. Leverrier has recently adopted this method of construction for the barometers used at telegraph stations in France. The getting rid of the trouble of adjusting the mercury in the cistern to the zero point previous to each reading, and the very moderate price for which this barometer has been made, are recommendations so strong that they will probably soon lead to its general adoption.

The method of testing thermometers is so simple as scarcely to require an explanation. For the freezing point, the bulbs, and a considerable portion of the tubes of the thermometers, are immersed in pounded ice. For the higher temperatures, the thermometers are placed in a cylindrical glass vessel containing water of the required heat, and the scales of the thermometers intended to be tested, together with the standard with which they are to be compared, are read through the glass. In this way the scale readings may be tested at any required degree of temperature, and our usual practice is to test them at every ten degrees from 32° to 92° of Fahrenheit. For this range of 60° the makers who supply the Board of Trade are limited to 0·6 of a degree as the maximum error of scale reading; and so accurately are these thermometers made, that it has not been found necessary to reject more than a very few of them. This is a proof of the practicability of making cheap thermometers, adapted for all the requirements of the mariner, nearly as perfect as it is possible to read them.

With some opticians it is not unusual, when captains break their thermometers, to apply new tubes to the old scales; and we occasionally meet with thermometers which require corrections of four or five degrees and upwards, with contrary signs at the two extremes of temperature in which we test them. It can scarcely be supposed that the captain of any ship would trouble himself to take observations with such a thermometer if he knew its indications to be so erroneous; and we hope that the means now

afforded to the mariner to test his instruments, will soon lead to an improvement in their construction.

I do not know anything which is more likely to lead to a great improvement in navigation, than the encouragement which is now given by the Board of Trade to the intelligent mariner to keep, in a systematic manner, a record of the various meteorological and astronomical phenomena observed at sea. The captain who avails himself of every opportunity to ascertain the position of his ship and the error of his compass by astronomical observations, and who keeps his meteorological record in such a way as to enable him to trace those changes by which he is warned of the approach of an iceberg, or of a coming storm, must, on the average, conduct his ship from port to port quicker and in greater safety than he would do were he to neglect such observations.

ON THE CHARACTER OF HAMLET.

By the Rev. Arthur Ramsay, M.A.

(READ 10TH APRIL, 1856.)

Of all the wonderful creations of our many-sided national dramatist, none has provoked greater discussion, or occupied the attention of more learned men, than the play of Hamlet. Goethe, Coleridge, Tieck, and Schlegel—the two first, themselves poets of the very highest order—have brought kindred genius and rare talent to the examination and criticism of this inimitable production. And still we feel that the character of Hamlet is in many points yet a mystery; that the lights and shades which an enlightened criticism may throw upon it, the latent beauties of delineation which a reverential study may detect, and the different phases which a keen and far-sighted research may bring into view, are absolutely inexhaustible. The reality of Hamlet's madness, the genuineness of his love for Ophelia, his course of conduct toward the queen his mother, and the king his uncle, the curious combination of indecision of purpose in his resolutions, with a certain promptitude of action in his deeds when necessitated to act on the spur of the moment; all these, and much else in this play, are points about which the readers of Shakspere have ever formed, and will ever form, various and conflicting opinions, and entertain a difference of idea, extending even to the notions which they form when speculating on the personal appearance of the hero.

This uncertainty of motive, and apparent fickleness of design, by no means confined to the character of Hamlet, tend to thicken the atmosphere of mystery which envelopes the whole play. In mystery it begins and in mystery it ends. The mystery of humanity in the character of Hamlet, the mystery of existence speculated upon in so many of his speeches, the mystery of the world of spirits, the mystery of death, and the mystery of destiny, are all brought before us. And this mystery it is which attracts us so strangely towards this play, just as we are excited and attracted by the mysterious and the inscrutable in a character of real life.

The supremacy of chance, and the uncertainty of human plans and

actions, reign relentless throughout the whole play, and pervade every part of it; until, in a spirit of the most sublime irony, the poet causes the final catastrophe to result from an accident, in spite of all the counsels and determinations of the several actors, setting forth to us the great truth that

> "Our wills and fates do so contrary run,
> That our devices still are overthrown."

I have already adverted to the criticisms of our great poet-philosopher Coleridge. Of these critical hints (unfortunately they are nothing more) I have largely availed myself; and I must here express my agreement with the opinion of that prince of critics, that the character of Hamlet owes itself to Shakspere's deep and accurate acquaintance with the science of mental philosophy. Those, doubtless, who have been accustomed to hear Shakspere spoken of as a mere "irregular genius," or to think of him as described by Milton—

> "*Fancy's* child,
> Warbling his native wood notes wild,"

may be astonished to hear him spoken of as a great moral and mental philosopher. Medical and other writers have indeed borne testimony to his accurate observation of the *external* world; but we are less inclined to think of him as equally a deep and correct observer of the *inward* world. He was, however, so to speak, subjective as well as objective; and thus moral and metaphysical truths, of the very deepest importance, abound in his pages.* True he might not, perhaps, have an external knowledge of other men's *systems* gathered from the study of their works; but he was a philosopher for all that. His was essentially a philosophic mind—a mind which could *pass out of itself*; and there is a great difference between having an external knowledge of philosophy, and being *inwardly* a philosopher. Likely enough Shakspere had never read Plato; but still he was in many points an admirable Platonist: like Plato he was a philosopher of Ideas; like Plato's, his philosophy was the "interpreting of appearances," the wish to be everywhere at home, the undressing of the soul; his pre-eminent excellence was that he could lay aside self, transplant himself into the minds of his fellow men, and be perfectly at home

* The distinction between Reason and Understanding, (so constantly forgotten by writers of the last century, and of late years revived by Coleridge,) is constantly found in Shakspere. In this very play he distinguishes between the *capability* of the *discursive* faculty, the "large *discourse*, looking before and after," and the *power* of the *intuitive* faculty, or "*god-like reason*;" the former being merely concerned about *conceptions*, the latter about *ideas*.

there, laying bare their very souls, and not only seeing, but expressing their thoughts in language, every word of which is itself a thought and a picture. He could pass out of his own into their position; originate, think, and express the thoughts and reflections natural to them in that position. Shakspere, in fact, differed from other men, principally in having more *humanity* than they had. He had, as it were, a family likeness to every other man, and thus he deserves the epithet of *myrionous*,* the "myriad-minded one," which Coleridge has transferred to him; and the title of "the many-sided," which Carlyle has applied to Goethe, might, with much more truth and fitness, be attached to the name of Shakspere. But Shakspere was not only an observer of other men's characters, he was a close and deep observer of the law of his own mind; and it is to this habit of deep self-observation that we owe the character of Hamlet. Coleridge has truly remarked that one of Shakspere's modes of creating character is to conceive any one intellectual faculty in a morbid excess, and then mentally to place himself with the same tendencies in the same position. And this he has done in his creation of Hamlet. In Hamlet he has embodied his idea of one in whom the Reason predominates in an inordinate and unhealthy degree over the Will, or acting principle; and this character he has placed in a situation of overwhelming exigencies—a situation in which promptitude, decision, and self-reliance, are absolutely indispensable. It is not, however, the incapability of action which Shakspere portrays in Hamlet, for when the latter does act, he acts with energy, decision, skill, and success—ever equal to the call of the moment. But in him the abstract intellect is too strong for the active impulse. Ever theorizing and generalizing on the things and circumstances around him, looking into, dissecting, and anatomizing his own thoughts, and pursuing, so to speak, the somewhat unprofitable luxury of "thinking upon thinking," he remodels and renews his resolutions, and the more he does so, the longer he defers the execution of those resolutions, until, in the anguish of doubt and indecision, he breaks out into the passionate exclamation,

"O what a rogue and peasant slave am I."

And yet how far is Shakspere's Hamlet from exciting in us any of those feelings of pity and contempt with which we usually regard the indecisive and inactive. On the contrary we cannot but agree with Ophelia's

* See Coleridge, "Biographia Literaria," vol. ii., page 13.

beautiful but melancholy eulogium of him. His is indeed a "noble mind"; he is a prince with the feeling of the good and the beautiful, dignified by the consciousness of high birth; he is a gentleman, pleasing, pliant, and courteous;* he is a man of genius, and as such he possesses that craving after the unseen, the indefinite, and the unknown, which most easily besets men of genius, and that aversion to action which constantly prevails among such as have a world in themselves. But Hamlet is not only a prince, a scholar, and a gentleman—he is more than this; he is a philosopher—not one indeed of the very highest class, but still a philosopher—accustomed to raise his mind from the things of sense around him, to the grand ideas *within* him and *above* him; one who "could be bounded in a nut shell, and count himself king of infinite space"; so unworldly that to him

> "Weary, stale, flat, and unprofitable,
> Seem all the uses of this world;"

ever (and herein he is most of all a philosopher †) contemplating and reflecting on the law of his own mind, seeing "into the *life* of things," constantly generalizing, till even when making a resolution

> "To wipe away all trivial fond records,"

he sets down "on his tables" a general observation; and thus his

> "Native hue of resolution
> Is sicklied o'er with the pale cast of thought,"

and in spite of all his reasoning, all his plans and purposes, the consummation takes place just the same as it would have done without these. Into the Philosophy of Hamlet we have not now time to enquire; it only needs a careful examination, however, to perceive that this is quite as wonderful as his character.

In contradistinction to the glorious *imagination* and mysteriously deep philosophy of Hamlet, stands the sober common sense of Horatio, by its very contrast giving greater prominence to, and heightening the effect of the character of Hamlet. Horatio was peculiarly a healthy-minded man. If Hamlet's mind was cast in the Platonic mould, Horatio was eminently an Aristotelian, or rather, perhaps, as he says of himself,

> "More an antique Roman than a Dane."

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* In the scene with Osric, (Act v. Sc. 2,) Hamlet's gentlemanly manners, as well as the superior grandeur of his philosophy, shine conspicuous, the lofty condescension of his conscious superiority, and his good natured playfulness forming a fine contrast to Horatio's impatient and almost pettish remarks to that courtier.

† Novalis says well on this point, "Die Philosophie ist eine ideale-selbster-fundere methode das innere zu beobachten."

His philosophy, such as it is, begins and ends in *doubt*. Its materialistic and sensualistic character is brought forward in the very first scene of the play, where he calls that mysterious appearance, which at the midnight hour is occupying the thoughts and attention of the officers on the platform, "this thing"; and says of it, "tush, tush, 't will not appear." In fact the coldness and the oppressive stillness of the night—"not a mouse stirring"—the glimpses of the moon above, the time-worn towers behind, the hollow murmur of the sea beneath, the mixed feeling of awe and alarm in the officers on the watch, and the strongly contrasted contempt of Horatio for the supernatural, are the most remarkable points in this opening scene, so artistically introduced, and so well fitted to prepare us for the appearance of the ghost of Hamlet's father, and the mysterious character of the whole play. Marcellus remarks of him,

> "Horatio says, 't is but our fantasy;
> And *will not let belief take hold of him*,
> Touching this dreaded sight twice seen of us;"

and he himself afterwards says,

> "I might not this believe
> Without the *sensible* and true avouch
> Of *mine own eyes*."

And when this unbelief of his has proved to be foolishness, he is full of the philosophy of the schools, and sets to work to resolve the phenomenon into an historical prodigy,

> "A mote it is to trouble the mind's eye."

In the midst of his theorizing the ghost re-enters, when he fancies it must either be an illusion, or else have flesh and blood;

> "Stay *illusion!*
> If thou hast any sound, or use of voice,
> Speak to me:"

and when it answers not, he is for assuring himself, by means of his hands, of the reality of the prodigy, bidding Marcellus stop it, and strike at it, not seeing that he does it,

> "Wrong being so majestical,
> To offer it the show of violence."

That which is beyond the comprehension of the sensuous Understanding, Horatio is for rejecting as "wondrous strange," so that Hamlet takes occasion to tell him,

> "There are more things in heaven and earth, Horatio,
> Than are dreamt of in *your* philosophy."

The contrast between the imaginative spirit of Hamlet and the practical

understanding of Horatio, runs through the whole play. For imagination to revel in philosophizing on the littleness to which all the sensible greatness of man may be reduced, and to trace "to what base uses we may return," Horatio thinks "were to consider too curiously." Some of Hamlet's sublime speculations he reduces to

"Custom hath made it in him a property of easiness;"

others he takes no interest in, merely answering with "It might, my lord," "Ay, my lord." In the church-yard he obviously dislikes the whole scene by which he is surrounded. To Hamlet's question "Is not parchment made of sheep-skins," he replies, with the most technical gravity, "Ay, my lord, and of calves-skins too." This question he can resolve, but it is plain that Hamlet's beautiful address to the skull of Yorick makes little or no impression on his mind. And yet, though in Horatio the Understanding does predominate over the Reason, still it has not wholly extinguished the latter. Nay, it would seem that his sensualistic philosophy was in a great measure learnt in the schools, and was, perhaps, rather the *external result* of his education, than the *internal law* of his own mind; as it is, every now and then he gives utterance to a note-worthy truth, of a nature not to be expected from him. We may also observe that Bernardo's opening salutation to him,

"Welcome, Horatio; welcome, good Marcellus,"

shew him to have been held in some degree of respect; and most true to nature (as when is he not?) is Shakspere, when he makes Hamlet love, value, and respect Horatio, ever appealing to his judgment, as one of the

"blessed are those
Whose blood and judgment are so well comingled,
That they are not a pipe for fortune's finger
To sound what stop she pleases."

The more in keeping with real life is it that Hamlet should thus lean on his friend, since that friend is so different from himself; his fine, imaginative, metaphysical, but unpractical spirit naturally clings to the strong, coarse, but sober and practical understanding of Horatio. Many points, too, they have in common: Hamlet is a "noble heart," a good lover, ready to wear his friend "In my heart's core, yea, in my heart of hearts;" "Most generous and free from all contriving," he "will not" "peruse the foils," ready to acknowledge ungrudgingly and openly, as he does in the case of Laertes,

"I have done you wrong."

Horatio, too, is a good friend, honest, and sincere, as well as sensible and

judicious, and moreover, like Hamlet, a scholar and a gentleman.

A great deal lower than these two comes Polonius. Some critics (Tieck among the number) have fancied Polonius to be Shakspere's representation of an able and experienced statesman; others, on the contrary, suppose him to be one in whom the body has outlived the mind, or perhaps, to speak more accurately, the memory has outlived the reason. And in this latter view there is doubtless a considerable degree of truth. The sentiments to which Polonius gives utterance are, indeed, but the rags and shreds of his former wisdom: still even from these we may judge what was the tone of thought and feeling of his better days. From these we may well conceive Polonius to be, in part, Shakspere's anticipative embodiment of the petty philosopher of a later age. He is a philosopher of the Understanding, and of the Understanding only. If Hamlet be a Platonist, and Horatio an Aristotelian, then Polonius is (of course I speak anticipatively) a disciple of Locke; his wisdom, such as it is, is founded wholly on "observation and experience"; he is "full of wise saws and modern instances"; he is one of those whom Coleridge* has well described as being like "a Cyclops, with one eye only, and that in the back of his head." Polonius is a maxim-monger, and the universal character of his maxims is selfishness—selfishness and a mere seeming knowledge of the *outward* part of the world—a knowledge of the superficies of man, acquired by worldly experience, combined with a total ignorance of all that lies beneath this surface, of every thing good, noble, and beautiful. Thus his precepts are exactly those of Lord Chesterfield and of Rochefoucault;† characterised by a morbid distrust of his fellow-men, arising from that incredulity which is, after all, but credulity, saying 'No' instead of 'Yes,' and nodding from behind instead of from before, and is generally allied to extreme credulousness of aught which helps forward the favourite theory. These traits, as wells as an enlightened selfishness in the reasons on which he founds his maxims, run through his precepts, all of which relate to mere external matters.‡ Their author is one of those who begins from

* See Coleridge, "Table Talk," page 37.

† To many of Polonius' precepts, such as "Take each man's censure, but reserve thy judgment," "Neither a borrower nor a lender be," "Give thy thoughts no tongue," we may find exact parallels in Rochefoucault's "Maxims."

‡ We must make one exception, namely, that noble piece of advice which closes the address to Laertes,

"To thine own self be true;
And it must follow, as the night the day,
Thou canst not then be false to any man."

without, but never proceeds inward; his soul is a slave to the outward, and he knows not that "he who would ascend upward must retire inward." Polonius, moreover, is one of those modern philosophers who believe in the omnipotence of accomplishments, and thus sends his son, at an early age, into loose and exciting society, to become initiated in those dissipations which a certain class of moralists, or rather anti-moralists, have asserted to be a natural preparative for entering upon an active life—a kind of mud bath into which the youth is, as it were, necessitated to plung before he is privileged to put on the toga of manhood; and he not only sends his son abroad to shew

> "How much a fool that has been sent to roam
> Excels a fool that has been kept at home,"

but he institutes a notable system of espionage over him, and even instructs his servant to speak of him as a "perfect gentleman," a dashing young fellow, an adept in swearing, gaming, drinking, and every species of vice at all tolerated by society, vices which that servant himself considers to imply dishonour. Mark, too, his metaphors, all taken from money-matters, his words with nothing in them, his circuitous craftiness, his inflated self-importance, his ignorance of his own ignorance, and of everything at all above himself, his positiveness, and his repeated assertions that all opinions but his own are *ipse dixitisms;* his perpetual and ill-timed boastings of his own superior acuteness and knowledge of the world,

> "As I perceived it, I must tell you that,
> Before my daughter told me."

> "Hath there been such a time, (I'd fain know that,)
> That I have positively said, 'T is so,'
> When it proved otherwise.

Besides these there are several other noticeable points in the character of Polonius: his suspicious disposition; his fondness for petty intrigue, without which he can do nothing, and with which he goes blundering on, until he is killed in a closet intrigue at last; the *arrangement* of *talent* in his speeches, as contradistinguished from the *method* of *genius** which (as Coleridge has well shewn in the concluding Essays of the "Friend") uniformly pervades every speech of Hamlet.

While Horatio commands *respect* and esteem even from one so differently constituted as Hamlet, the old expediency statesman almost moves the latter to

> "That scorn which wisdom holds unlawful ever."

* Compare Coleridge's "Friend," vol. iii. Essay iv. p. 113, and Essay i. p. 71, with Novalis' remarks, "In der *Methode*, der Regularisation des Genius."

Polonius, on the other hand, with admirable self-complacency—Polonius, the philosopher of maxims—consoles himself with the notion that Hamlet, the philosopher of ideas, is mad. Shakspere thus agrees with Cervantes in making the philosopher of the *Pure Reason* misunderstood, or rather not understood at all, by the man of the Understanding. Sancho Panza can no more appreciate or understand Don Quixote's motives and character, than Polonius can Hamlet's.* One proof that this view of the character of Polonius is in the main correct, we have in the fact that his maxims, disjointed from the character itself, are so often quoted with approbation, as the veritable wisdom which Shakspere was commissioned to preach to his fellow-men, as if Shakspere had been a mere precept menti-facturer, teaching no higher philosophy than the way to be "healthy, wealthy, and wise," and to pass through the world with some five or six "golden rules," suitable to all occasions, and sufficient for all purposes.

We must next examine the result of Polonius' teaching, and see what he to whom his maxims were given, and who endeavoured to practise them, really was. Laertes became what his father wished and intended him to be, a finished gentleman, a perfect man of the world; in the poet's own words—

> "An absolute gentleman, full of most excellent differences,
> of very soft society, and great showing: indeed, to speak
> feelingly of him, he is the card or calendar of *gentry*."

While Hamlet is at once ready to forgive and forget, nay, to make the first advance towards reconciliation, with

> "I am very sorry, good Horatio,
> That to Laertes I forgot myself,"

Laertes stands on minute points of honour, and

> "Will no reconcilement,
> 'Till by some elder masters of known honour
> I have a voice and precedent of peace."

Bishop Warburton and others speak of Laertes as a "good character." What these gentlemen's notions of 'goodness' were they have not explained; unless they were peculiarly eccentric, it is somewhat difficult to conceive that they could have read the play with sufficient attention to

* Of course I do not mean to institute any comparison between the character of Don Quixote and that of Hamlet, further than that in each the Imagination has grown in such an undue proportion as to overbalance all the other mental faculties. Hamlet is an example of a fine Reason and a weak Will; Don Quixote of a fine Reason and a strong Will, but in consequence of a deficiency of the Understanding, or substantiative power, the Will almost always obeys the Reason wrongly; both are wanting in sense—the conservative power, so to speak—in the intellectual republic.

into the depths of female hollowness and iniquity, love falls into the back ground, and is at once ranked among those "trivial fond records" which he has sworn to erase from his heart and brain, and when he perceives that Ophelia is being used as a decoy, and is acting a part not her own, he can address her in that wild ironic bitterness of tone, which excites our wonder and astonishment.

Much of what has been said may appear somewhat extravagant and far fetched, especially to those who have been taught to look upon Shakspere as a mere beautiful "lusus naturæ"—a wild and extravagant genius, deficient in learning and culture, who neither meant nor understood a tithe of the deep and beautiful ideas which critics fancy that they can discover in his wondrous soul-creations. When studied as he ought to be studied, in a humble and loving spirit, Shakspere can only appear such to ordinary and infra-ordinary minds. And as for his not meaning all the beautiful things that are to be found in his words, it is one of the surest marks of a true poet that the outpourings of his genius contain many hidden beauties, variously unfolding themselves to different orders of character; the greater the poet, the more living and expansive are his words, and the more truths they contain for the larger number of men of every variety of age, and every mould of mind,—truths always rising up like the waters of a spring, ever fresh and ever inexhaustible. Thus the words of a true poet, like Shakspere, will rarely, if ever, be comprehended in their full significance, by any one single individual.

But apart from this, somewhat of the mystery in the play of Hamlet may arise from the circumstance, that in common with the highest painters and sculptors,* even Shakspeare has not wholly expressed his idea. Like the Gothic architecture, his works must remain in a great measure ideal, pointing even higher than they reach, since any one of his dramas, taken in its *oneness* and *entirety*, conveys to the mind far more than lies on the surface of the mere words themselves.

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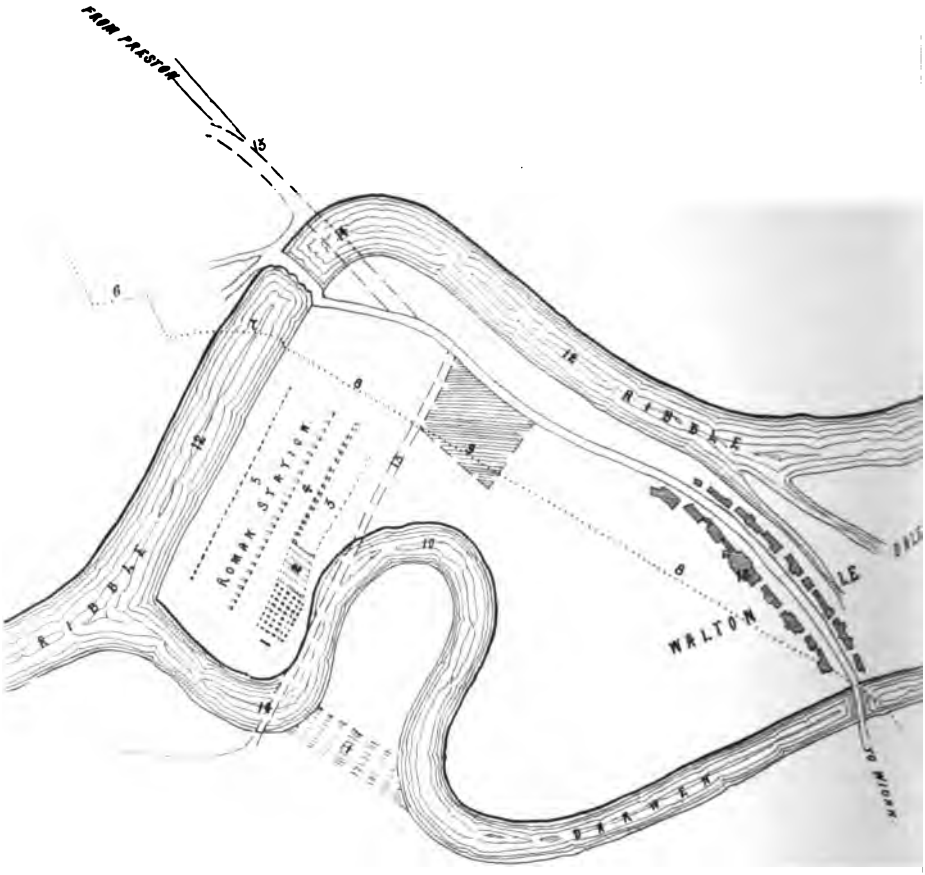
* Compare Thorwaldsen's remark: "My genius is decaying. Till now my idea has always been far beyond what I could execute. But it is no longer so. I shall never have a great idea again." Quoted by Hare, "Guesses at Truth," first series, p. 83.



REFERENCE.

Nº 1.	THE 'PLUMP' IN WHICH THE ROMAN REMAINS WERE FOUND.
2	Mr MAITLAND'S GARDEN. IN WHICH REMAINS WERE FOUND.
3.4.5.	THE THREE TERRACES.
6	THE BIG-BAG INDENTATION
7	LARGE GRAVEL BED AND FORD
8	SUPPOSED ROMAN ROAD
9	Mr CALVERT'S WEAVING SHED, IN WHICH THE WORKMEN FOUND REMAINS OF ROAD
10	OLD COURSE OF THE DARWEN, ACCORDING TO ROBERT PORTER'S MAP, PUBLISD IN 1738
11	PRESENT COURSE OF THE DARWEN.
12	THE RIBBLE
13	NEW ROADS
14	NEW BRIDGES
15	OLD VILLAGE OF WALTON-LE-DALE.

———— THE SOLID LINES ARE FROM ROBERT PORTER'S MAP.

– – – – – THE BROKEN LINES INDICATE SUCH MODERN ADDITIONS AS ARE NECESSARY TO THE PRESENT INQUIRY.

..... THE DOTTED LINES INDICATE THE ROMAN REMAINS.

ON THE ROMAN REMAINS RECENTLY DISCOVERED AT WALTON-LE-DALE, NEAR PRESTON.

By Charles Hardwick, Esq.

(READ 3RD APRIL, 1856.)

Notwithstanding the destructive influence of time, of agricultural improvement, and of wars engendered by personal cupidity, "domestic treason or foreign malice," remains of several Roman roads and stations may yet be traced in various parts of Britain. As may be anticipated, however, from the imperfect character of the few ancient records which have descended to us, considerable difference of opinion has been expressed by antiquaries respecting the identity of existing localities with those of the Roman topography.

In this respect Lancashire appears to be rather more unfortunate than many other portions of the island of Britain. The venerable Camden expresses a fear that he would "give little satisfaction either to himself or his readers" when he enters upon the consideration of the archæological remains relating to this county. Although much has been discovered and written since his time, the subject still remains enveloped in considerable obscurity; the most eminent modern antiquaries by no means agreeing even in the general outline. Every new disclosure of remains indicating Roman occupation must therefore be regarded as an event of considerable interest. I take the present opportunity of acknowledging my obligations to this Society during my recent investigation of the site of the Roman station at Walton-le-dale; not merely for the valuable information contained in the published volumes, but also for the confidence and enthusiasm which the example of several of its members induced, and without which, perhaps, the first indications might have been passed over as relatively unimportant.

The Roman remains at Walton were brought to light, like many others, by fortuitous circumstances. During the past year I have been occupied in collecting materials for a "History of Preston and the neighbourhood."

I was aware of the existence of a tradition which identified a mound planted with trees, and known by the name of the "Plump," with the burial ground of "Scotch warriors" slain in Cromwell's victory over the Duke of Hamilton, in 1648. I therefore visited the spot several times in June last, for the purpose of examining its structure, and ascertaining whether or not existing remains countenanced the tradition. Some workmen, employed by the highway surveyor, had commenced digging for stones and gravel. This fortunately afforded an excellent opportunity for a minute inspection. The labourers, being resident in the neighbourhood, had heard of the tradition, and fully expected to meet with some memorials of the battle. During the absence of the excavators, I picked up a piece of metal, which had evidently formed part of some manufactured article. It seemed too thin to be a fragment of a skull-cap, or a piece of plate armour. It however distinctly presented an indentation from the blow of a pointed instrument, and there were some dark red stains upon it. The metal itself appears to be a mixture of tin and lead. This served to stimulate me to further investigation. Three brass coins were next found by the workmen, two of which were illegible from corrosion; but the other was obviously Roman. This coin has since been pronounced to be a first brass of Domitian. The labourers thought it a "Scotch penny," from the imperfect figure on the reverse bearing some resemblance to a kilted Highlander. Thus whilst searching for remains of the Commonwealth period, proofs of Roman occupation were disclosed.

Remembering the injunction of Mr. Robson,* I immediately instituted a stricter search. Specimens of Roman pottery were soon found in abundance, when the attention of the workmen had been directed to its peculiar character and importance. A large quantity of earthenware, and other remains, were taken from their place of deposit by myself and several friends to whom I communicated the discovery. During *this* exploration, an area of nearly one hundred superficial yards was excavated to a depth of about three feet. In the original soil (or "sea sludge," as the labourers termed it,) a foundation wall, about eight yards long, eighteen inches broad, and nearly a foot in depth, was discovered. It is formed of irregularly shaped, but perfectly adjusted fragments of the red-sandstone rock of the neighbourhood, which, from having been buried so long in the earth, has

* Transactions of the Historic Society, vol. iii. p. 75.

become partially disintegrated. The Romans first taught the British people the use of mortar; and as no mortar or other cement had been employed in the construction of this foundation wall, the presumption is that it was the work of the original inhabitants. Above this was spread a layer of large boulders, mixed with *glareæ*, or gravel, in and upon the surface of which the Roman remains were discovered. This stratum was about a foot in thickness, and, from the first, was pronounced by the workmen, who were accustomed to dig for road materials, to be of artificial construction. The fact that the red rock foundation wall was discovered *below* the stones and gravel, confirms their opinion. The boulders only extending to a certain distance, the excavators relinquished their labour, and filled up the cavity, or doubtless many other relics of interest might have been discovered, as the mound extends considerably further to the east and north of the site of the excavation. Two, or even three distinct terraces may still be perceived descending towards the Ribble, notwithstanding the garden cultivation to which a great portion of the land has been subjected for some years past. This peculiar formation, Mr. Robson informed me, resembles much the station at Caer-rhun, about five miles beyond Conway. I afterwards discovered, by digging a small hole at the western extremity of the mound, beneath the trees, that the Roman remains extended fifteen yards further in that direction than the original excavation. Mr. Martland, of the Bridge Inn, Walton-le-dale, the tenant of the adjoining land, had previously exposed a large quantity of bright red clay fragments of pottery, &c., considerably to the eastward of the "Plump," but not being aware of their archæological importance, the prettier portions were given to his children, and the remainder re-consigned to the earth. I have, myself, picked up Roman pottery at the eastern extremity of this garden. Thus the extent of the station *already discovered*, from east to west, is about one hundred yards.

Beneath the trees in the "Plump," the vegetable soil and alluvial deposit had accumulated to nearly the depth of two feet above the Roman remains. In the adjoining garden, the gravel and stones are nearer the surface. Many of the latter have been removed during the past and some preceding winters. This portion being the most elevated land in the neighbourhood, has been rarely covered by even the highest floods, and, consequently, but little river *debris* is found upon what I call the third terrace. It is not so,

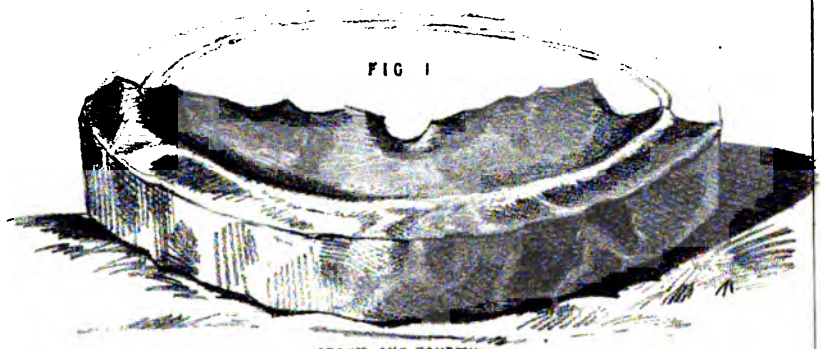
however, with the two lower ones. Here the periodical deposits have formed a considerable depth of very superior soil. Stepping across these terraces from south to north, I found the highest and middle plateau to be each about thirty yards in breadth, and the lowest from fifty to sixty, making the extent of the entire station about one hundred and twenty yards. The terraces are elevated from two to three feet above each other. From the western extremity to what appears to have been the main highway from the south to the ford over the Ribble, the distance is about three hundred yards.

Amongst the remains discovered are four brass coins, besides the one already mentioned, viz., a "second brass," with the head and name of Domitian distinctly legible, and a "first brass," in moderate preservation, which presents the effigy of Antoninus Pius. The others are too much corroded to be clearly deciphered. It is probable, however, from the general form of the head, that one is a Titus Vespasian. Amongst the metallic substances are a small piece of copper, some fragments of thin sheet lead, one shewing indication of fusion like solder, two fragments of Roman pewter vessels, and several large iron nails. (Plate A, fig, 5.) These last are much encrusted with gravel and sand, from the oxidizing of the metal, and the lead is covered with a thick white coating, from a similar cause. A small bronze *fibula*, or toga button (as the fastening is in the centre), bearing marks of elegant and elaborate chasing, and some remains of purple enamel, was likewise picked up. (Figs. 2 and 4, plate A.) Another *fibula*, of totally different form and character, has since been found by Mr. Martland's son, together with a small rod or bar of iron plated with silver. The latter is about three inches and a half long, and one-tenth of an inch in diameter. The *fibula* is of fine brass, ornamented in the centre with a circular figure in bright red enamel, resembling the stone setting of a modern finger ring. (Plate A, figs. 6 and 7.)

Amongst the stone articles are a large portion of an "ass," or lower stone of a quern, or hand corn mill (plate A, fig. 8); several fragments of "riders," or upper quern stones, cut from rock resembling blue lava (plate A, fig. 1), and some remains of circular stones of a similar character, supposed to have been potter's wheels. One small wheel, or spindle head, about an inch and a half in diameter, formed of very fine bluish stone,

PLATE A.

FIG 1



ABOUT ONE FOURTH

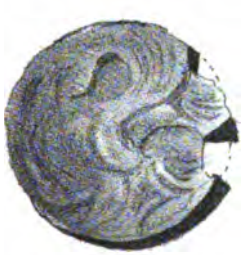


FIG 4.

FIG 3.

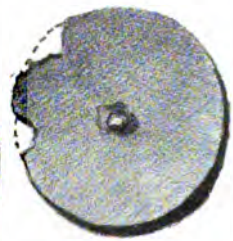


FIG 2.

NEARLY FULL

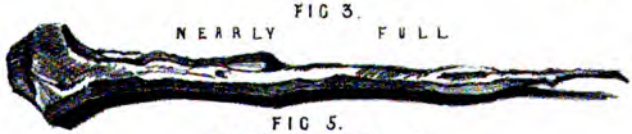


FIG 5.
ABOUT ONE HALF

FIG 6.

NEARLY FULL

FIG 7.

FIG 8.
ABOUT ONE FOURTH.

REMAINS FOUND AT WALTON-LE-DALE

PLATE B

FIG 1

FIG 2

FIG 3

FIG 5

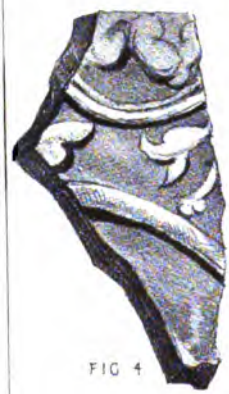


FIG 4

FIG 6

FIG 7
RATHER LESS THAN FULL SIZE

exhibits upon its side marks of friction, apparently produced by rapid revolution. (Plate A, fig. 8.)

The fragments of earthenware are extremely numerous, and appear to have been formed from five or six distinct clays or composition pastes. Some of the pieces of "Roman red lustrous ware" exhibit elegant and well executed figures in relief. Many of the ornamental designs of these fragments are identical with those on specimens figured in the catalogue of the Museum of Practical Geology, found at Roman stations in Britain and on the Continent. (Plate B.) A *relievo* of the Venus de Medici is precisely similar to those upon the beautiful vase, represented at page 62 of the catalogue referred to.

A single fragment presents a good specimen of a peculiar species of earthenware, often discovered in Germany and Britain, in which lines of dots and figures in relief have been added, after the body of the vase had been formed and turned in the lathe. This specimen is unglazed. (Plate C, fig. 1.)

There are many fragments of amphorse and lesser vessels, of a great variety of form and material. Two necks of vases with single handles, in common red clay, resemble those found at Stockton Heath, and figured at page 33, vol. ii., of the Historic Society's Transactions. (Figs. 2 and 4, plate C.) One large amphora handle exhibits the potter's stamp. From superficial decay, all the letters are not very legible; but it appears to resemble either **PVCRM** or **FVCRN.** (Plate C, fig. 3.) This vase handle has been much injured since I made the drawing. There is an immense number of fragments of a coarse black or bluish ware, of various shapes and sizes. Many have formed low shallow dishes, such as fig. 5, plate C, and appear to have been used for cooking purposes.

Considerable lumps of fine red clay, kneaded into a paste, were likewise met with, as well as a few fragments of Roman tiles and bricks. It is therefore very possible that a brick-kiln, or an establishment for the manufacture of the coarser kinds of pottery, existed at Walton.

Amongst other miscellaneous objects, I took from the surface of the Roman gravel two portions of a horse's jaw. One consisted of the entire half of the lower maxillary bone, but it was in such a decomposed condition, that it broke into fragments on removal. The teeth, however, are quite perfect. The core of a horn of one of the extinct species of oxen, the

Bos longifrons, was likewise found amongst the Roman remains, together with a few bones. Similar horns have been dredged out of the Ribble, as well as skulls and bones of the huge *Bos primigenius* and other extinct animals. The Rev. Mr. Thornber possesses a skull of the *Bos longifrons* which was found in the Roman station at Kirkham. One of the garden labourers states that he came upon some burnt ashes, covered by a vessel of rude pottery, but it was not preserved. I have since learned that other remains supposed to be Roman or British, including bronze celts, spear heads, &c., had been previously found in the neighbourhood.*

The trees on the "Plump" have been cut down during the past winter, and I understand that some of the workmen employed have procured a few more coins.

Notwithstanding the accumulation of alluvial deposit, a broad agger is still traceable from the immense natural gravel bank or ford at the Ribble, towards the present bridge over the Darwen. The workmen employed in the erection of Mr. Calvert's weaving shed, which crosses its line, state that at some distance below the surface, they came upon a compact mass of road material, so hard that a pick-axe could scarcely penetrate it. Near Brownedge Chapel, a little further south, there appears still to exist a large fragment of the Roman highway, now used as a private road, but marked on the ordnance map as "Mainway-gate." On the north bank of the Ribble, opposite the ford, a zigzag indentation in the face of the steep ascent may still be seen. From this point, the road appears to have passed in a straight line over the end of Church Street, near the House of Correction, to Preston Moor. As usual, in the immediate neighbourhood of the town, all remains are lost. The cutting where it passed the Swillbrook, between Mr. Eastham's new mill and Albyn Bank, is, however, distinctly visible. During the construction of the Freehold Park estate in Fulwood, fragments were discovered upon the section allotted to Mr. Brewer. A small portion of the Roman agger may yet be seen on Preston Moor, where the land slopes towards the brook, opposite to Mr. Brewer's plot. This road intersected the one from the "Portus" to Ribchester (the seventh iter of Richard), on the present "Watling-street," at about an equal distance from the "Withy Trees Inn," and Fulwood Barracks. The Rev. John Clay,

* Nearly the entire remains yet found are in the possession of myself and Mr. Alderman Brown, who zealously aided me in the prosecution of my investigations. We purpose presenting the principal objects to a Museum in Preston.

PLATE 6.

FIG 1
NEARLY FULL

FIG 4
ONE HALF

FULL SIZE

FIG 3

FIG 2
ONE HALF

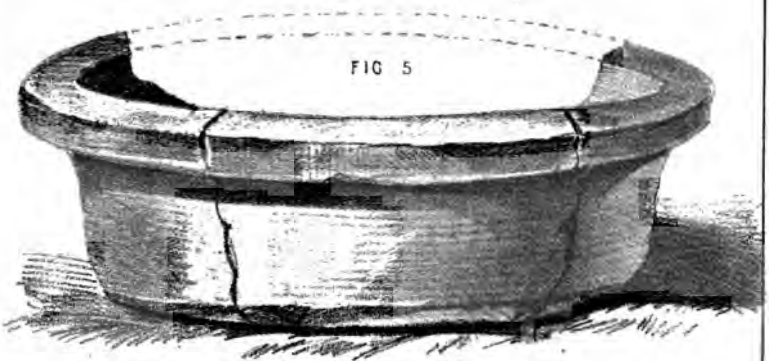


FIG 5

NEARLY ONE HALF

ROMAN POTTERY FOUND AT WALTON-LE-DALE

in one of his interesting lectures on the Ribble, in 1845, gave some particulars respecting the destruction of these roads, which are the more valuable, and the more worthy of preservation, as the progress of modern improvement has nearly obliterated all traces of them. He observed:—

"In the course of our enquiries about the roads, we were fortunate in meeting a fine old man, upwards of ninety years of age, named Richard Dewhurst, living on Cadley-moor, in a cottage in which he, and his father before him, were born. His memory respecting this road seemed very clear. He recollected 'breaking up'—seventy years ago—the gravel of which it was formed, beginning from the Withy Trees, crossing Cadley-moor, and continuing past Mr. Grimshaw's house, in the direction of Cottam Mill. There can be no doubt that this was a portion of the Watling-street; for the old man's memory brings it to Tanteston Hall, where its traces re-appear. Mr. Cartwright and I found faint evidences of it yet remaining near Plungington, and also near the lodge of water belonging to Cadley Mill. Our informant also well remembered that another road, constructed also of similar materials, crossed Preston-moor, and entered the Watling-street. On this road his fellow-workmen, employed in removing the gravel, found some Roman coins. The tradition which had come down to our venerable informant was that these roads stretched across the whole country. The 'one reaching from east sea to west sea; the other from north sea to south sea!' And as to the maker of the roads, tradition further declared that they were all made in one night, by the author of evil!"

I have, myself, heard, from good authority, that another old man, named Thomas Myerscough, who died last year, when upwards of ninety years of age, frequently stated that in his youth he had assisted to cart away the gravel from off Watling-street.

Dr. Kuerden, in his quaint way, describes these roads as they appeared nearly two hundred years ago. The learned doctor laboured hard to prove that Preston occupied the site of the Rigodunum of Ptolemy. He makes Ribchester the Coccium of Antoninus, and Lancaster the Longovicus of the Notitia. Speaking of the road from the coast to Ribchester, he says:—

"This highway, by the country people at this day cald Watling-street, & was well vewed by the learned and incomparable antiquary, William Dugdell, Norroy King of Armes, in his last visitation of the Gentry within

the county of Lancaster, An. Do. 1664, where by him and many other diligent observers there finding a rampire cast up with gravel, & the largeness of the bulk thereof, was judged to be a Roman strata. Besides, it was observed that from this Ribodunum (Preston) to the other Roman garrison, the Longovicus, or Caer werid of the Britons, their Green Citty (Lancaster) there was another lesser strata leading betwixt them, as diuers signes of a like rampire ouer Preston and Fulwood, more towards Garstang by Broughton, are yet conspicuous to the observations of many learned men as well as vulgar people."

Dr. Kuerden likewise mentions that not many years previous to his recording the circumstance, a "Roman Vrne in which was found great store of antient coynes," was dug up in Myerscough Park, near the line of the Roman road. The doctor states that he had himself seen most of these coins which were originally in the possession of "that ingenious gentleman, Edward Townley, Esq., the proprietor and owner of the park of ground where this urne was found."

Some of the elder antiquaries were of opinion that the great Roman road from the south to the north crossed the Ribble by the ford at Penwortham, and passed between Tulketh Hall and the Maudlands. This was first conjectured by Percival, and immediately ridiculed by the Rev. John Whitaker. Yet, with characteristic daring, he afterwards mentions the circumstance as probable, when it did not affect his favourite theory. The notion was followed by Edward Baines and others. The absence of discovered remains at Penwortham and Tulketh, and the presence of them at Walton and elsewhere, now clearly demonstrate the upper ford to be the one where the great road crossed the Ribble. The pretensions of the "square area" at Maudlands (lately destroyed) to Roman construction have been fully exploded.* It was, doubtless, an outpost in connection with the works erected by Col. Rosworm, the celebrated German engineer, after the capture of Preston by the parliamentary forces under Major-Gen. Seaton, on the 9th of February, 1643. † The town was re-captured, by the

* It contained a brick chamber, about six feet deep, and sufficiently broad to permit the descent of one of the workmen. This is supposed to have been constructed for a powder magazine. Some rude oaken staves were found in the ditch. These appeared to have formed part of a railing or palisade. The discovery in the mound of fragments of clay smoking pipes demonstrated its relatively modern construction.

† See Rosworm's pamphlet in "Civil War Tracts," published by the Chetham Society.

Earl of Derby, on the 21st of the following month, and the defences destroyed. Baines confounds Maudlands with Tulketh, and hence the blunder. West, the author of the "*Antiquities of Furness*," speaks, in 1774, of what he fancied to have been a Roman outpost; but his mound and ditch were situated at the head of the high promontory at Ashton, to the "SOUTH WEST OF TULKETH HALL."* A few months ago this mound was levelled; I examined it several times, but discovered no Roman remains. The ditch was evidently, to some extent, an artificial work. The locality may have been used by the Romans, or some of their successors, as an outpost, as it commands a magnificent prospect of the entire estuary, and a considerable portion of the valley to the eastward. Beneath the roots of the grass on the outside of the ditch, fragments of building materials were visible, probably the remains of the ruins described by West as existing in his day, and which had been occupied by the monks under Evanus, during the erection of Furness Abbey. The Domesday record testifies to a Saxon castle on the opposite headland at Penwortham. The site is termed "Castle Hill" to this day.

The discovery of a station at Walton is an event of great importance with reference to the determination of the route of the 10th iter of Antoninus. The recent discoveries in South Lancashire and Cheshire had shaken the hypothesis of the two Whitakers and others, that the iter traversed the county by Manchester and Ribchester. It only required proofs of Roman occupation near Preston to confirm the theory propounded by Mr. Robson, that it passed through Warrington and Lancaster. These are now found. Had the station been situated on the north instead of the south side of Preston, as Mr. Robson anticipated, the result would have been perfectly satisfactory, and the figures of Antoninus have required no emendation.† I may further add, that travelling in a direct line from Lancaster, by Cartmel, to near the head of Windermere Lake, where a Roman

* The "Maudlands" is to the east of Tulketh Hall. On the ordnance map, the site of the temporary "monastry" is marked nearer to the present Tulketh Hall than the mound alluded to. Both are now totally erased.

† Mr. Robson expected the remains of a *post* station, at least, might be found near the crossing of the Roman roads on Fulwood Moor. This is about two miles to the north of Walton, and agrees with the figures in the iter. This circumstance, together with the belief that Ribchester had been a seaport during the period of the Roman occupation, may, perhaps, account for the indifference with which the mound at Walton, situated amongst the alluvial soil of the valley, has hitherto been regarded by local antiquarians.

camp is marked by West, we get very nearly the distance of the next station from the one named Bremetonacis, viz.: 27 Roman miles. This would answer for Galacum. Doubtless, the three other stations mentioned in the iter may yet be found in Cumberland.

Overborough is on the Lune as well as Lancaster, and may, with equal propriety, claim to be the Ad Alaunam of Richard, or the Longovicus of the Notitia. If Walton be Coccium, the distance will about agree with the figures in one of the copies of Richard, which places Ad Alaunam at 36 miles north of that station, and account for the upper portion of his line presenting no similitude to that of Antonine.* The simple fact that Ptolemy mentions Rigodunum, and that Antonine does not, is, in my opinion, the best possible evidence that the 10th iter of the latter did not pass by that place. This Coccium has been a sad trouble to the Roman topographers of Lancashire. Both Whitakers fused it into Rigodunum by an etymological process. The historian of Manchester informs us that Rigodunum means the "Fortress of Royalty," and that Caer Coccui is the "City of Supremacy." This is, however, a somewhat different interpretation from that of his erudite namesake and successor. With him Rigodunum is Red River, and Coccui, Red Water. Dr. Whitaker assumed that there were *not* two stations on the Ribble. The discovery at Walton solves the problem, and relieves him of the difficulty, the red rock, earth, &c., being characteristic of the Ribble equally near Preston and at Ribchester. The station at Walton likewise completes a double line of forts, within the territories of the Setantii and the Volantii, the first being at the head of the estuaries, which, Tacitus says, Agricola "surveyed himself, and marked out the stations," namely, Stockton Heath on the Mersey, Walton on the Ribble, and Lancaster on the Lune. The second or inland line, higher on the same rivers, were Manchester, Ribchester, and Overborough. As a mere route for either military transit, or for postal communication, the lower, or coast road, from the level character of the country,

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* The route of the former appears to have traversed the eastern portion of Westmoreland, that of the latter "The Lake district," from the mouth of the Solway, or the western extremity of the "Picts' Wall." The roads unite at Lancaster, and are there joined, according to Percival, by a third from Carlisle. The circumstance that Richard has omitted a station at Lancaster is of little consequence. He did not profess to give all, and must have passed over more than one in the same iter, for he makes the distance from Brocavonacis to Ad Alaunam 47 Roman miles.

would naturally be more used than the upper, and hence the reason why it has found a record in the Itinerary.*

The elder Whitaker regarded Coccium as the capital of the Setantian territory. True, the "City of Supremacy" of a tribe of Ancient Britons would present but a poor figure in comparison with even a modern village. If there be any value in this interpretation it can only apply to the settlement of the Aborigines, and not to that of the Romans. Chester appears to have been the most important military station with them in this district, and Ribchester perhaps the next. The low mound at Walton, situated near the junction of the rivers Ribble and Darwen, is a locality very likely to have been selected for a stronghold by the original inhabitants, and its central position amongst the Setantian people is in favour of John Whitaker's supposition. When the surrounding country was clothed with primæval forest, it must have presented the very model of a fastness to the eyes of a people who dwelt for security amongst morasses and dense woods. The broad stream of the Ribble forms a natural fosse on the north and east, whilst the lesser, though not insignificant, Darwen, encloses the site on the west, and partially on the south. The lower lands in the neigbourhood of the rivers, would, at the period referred to, doubtless be sufficiently swampy to accord with the most fastidious Ancient Briton's taste with respect to fortification. A glance at Robert Porter's map, published in 1738, will show that the locality formerly presented even more attractions of this character than at present. The Darwen, in its course from near the site of Walton Hall, towards its junction with the Ribble, made a deep indentation eastward. This formed an additional double moat, and defended the mound on the south. The present straight course of the Darwen is artificial. The remains of the old channel may yet be distinctly seen. The centre of the curve reaches nearly to the weaving shed lately erected by Mr. Calvert. The situation likewise commands the old ford, or "pass of the Ribble." (See Map.) The Roman invaders often selected the sites

* By this route the following places would correspond with the southern portion of the 10th iter of Antonine:—Mediolanum, Middlewich; Condate, Stockton Heath, near Warrington; Mancocunium, Standish; Coccium, Walton, near Preston; and Bremetonacis, Lancaster. This, of course, implies, as suggested by Mr. Robson, that the Mancocunium, with its variation Mancunium of the tenth iter is a distinct place from the Mamucium, or Manutium of the second, the crossing of the two being at Condate.

of the British towns or encampments for their stations, and the discovery of the foundation wall, already alluded to, strengthens the probability that Agricola in this instance merely retained possession of a fortress previously occupied by the discomfited native inhabitants.

Camden placed Coccium at Cockey, on account of the similitude of the names. I have made some enquiry as to existence of any local terms* which may have been corrupted from words indicative of the presence of Roman people at Walton, but have not been very successful. This at best is dangerous ground to tread upon.

Walton-*le-dale* is the present title of the village, the valley being named Cuerdale. The Roman station is only about a mile distant from the spot where the immense Saxon and Danish treasure was found a few years ago. May not Cuerdale be a corruption of Caer-dale? The only relic of any portion of the word Coccium that I have yet met with is more humorous, I fear, than demonstrative of the existence of a remnant of the Roman appellation. However, it is worth notice, and may, perhaps, suggest something. Dr. Kuerden, in his description of Preston, nearly a couple of centuries ago, says, "There is, likewise, below the Churchgate barrs another public footway southward, leading towards the bridge over Rible into London-road; and this passage at its entrance out of town was called Cocker-hole." If we by this are to understand that the road led to Cocker Hall, it would exactly identify Walton with the word Cocker. This footway most probably traversed a portion of the Roman road. On leaving the town it was joined by a track of a similar character, which is thus described by Kuerden:—"Another *remarkable* foot passage toward Rible Bridge is through the churchyard southward, by the publiq schoole and antient place called Chappel of Avenam, over the Swilbrook southward, by west field to the aforesaid Bridge of Rible; and this passage is called the *Stoney gate*, being the greatest foot tract to the Burrough of Preston."

The discovery at Walton throws valuable light upon the much canvassed probability of Ribchester having been a "*sea*port," during the Roman occupation of Britain. The affirmative chiefly rested upon a vague

* Mr. Sibson, describing the road from Warrington to Lancaster, says, "it is probable there has been a fortified camp" at Walton, "to protect the pass of the Ribble." He adds, that Walton is Val-tun, or fortified town. The Rev. John Whitaker says Gual is the British word for rampart, and is formed into *Wall*, *Val*, *Bal*, and *Ual* or *Al*."

tradition, and a conjecture of the ever daring elder Whitaker, endorsed by the historian of Whalley. The latter learned antiquarian afterwards discovered that this position was not tenable, and honorably acknowledged it. Mr. Edward Baines, however, in 1836, published a singular paragraph on this subject, from which we might infer that, in his opinion, Ribchester had been a seaport in the time of the Roman domination. He says:—"It must be acknowledged that *Preston was not a Roman station*; but that when, by the gradual recession of the waters, or by that mighty convulsion of nature which threw up the huge mass of Pendle, and deranged the whole system of plants and minerals in the vale of the Ribble, to a great extent Ribchester sunk into decay, Preston rose upon its ruins and became the principal port of Lancashire." He further adds, in a note:—"No Roman remains have been found here" (Preston) "while at York, Lancaster, Ribchester, and Manchester, they abound."

Some antiquaries appear to expect that all remains ought to "come into court" at their bidding, or, thenceforth "hold their peace," in order that their theories may be freed from the disagreeable necessity of being reconciled with facts subsequently discovered. It would, however, have been very remarkable indeed, if such remains could have survived the mighty convulsion alluded to. In comparison with the time of the heaving up of the "huge mass of Pendle," the Roman occupation of England is but a thing of yesterday, as the merest tyro in Geology at the present day will easily understand. Mr. Baines afterwards altered his opinion and contended that the presence of the red rock in the bed of the river disproved the assumption of the elder Whitaker. The Rev. John Clay, however, in his lectures on the Ribble, strongly maintained that Ribchester had been a seaport, and that the bed of the river had been elevated by an earthquake, since the period of the Roman occupation.

The discovery of the remains in the centre of the alluvial deposit between the Ribble and the Darwen, opposite the ford over the former, furnishes better evidence of the condition of the valley with regard to tidal action, than a thousand speculations, however ingenious. The circumstance that the red rock crops out at an angle, and that the immense depth of debris in the valley is stratified horizontally, is satisfactory proof that the latter has been deposited *since* the elevation of the former, at whatever period that event occurred. The discovery at Walton may be said fairly to set

this question at rest; for if the tide had, at the time alluded to, risen six feet higher, or, what would amount to precisely the same thing, had the valley of the Ribble been depressed but six feet, the station could not have existed. Indeed, it must have required *then*, as *now*, to be well embanked, to protect it from the ravages of the winter floods, providing the river current and the tidal flow were no greater than at the present time. In all human probability the valley of the Ribble presents nearly the same general features as when the Roman legions left the country. Its superficial aspect may have changed; the alluvial deposits may have increased; the river channel may have become "sanded up," or diverted; marshy swamps may have been converted into solid earth; the dense oak forests which once crowned its banks, may have fallen before the axe of civilization; but no *proof* has yet been advanced that its *great* outlines have changed since the day when the painted Setantian warriors succumbed to Roman discipline and Roman valour, and resigned their stronghold in the midst of the swamps of Walton, to the soldiers of the victorious Agricola.

ON THE ETHNOLOGY OF SOUTH BRITAIN AT THE PERIOD OF THE EXTINCTION OF THE ROMAN GOVERNMENT IN THE ISLAND.

By Thomas Wright, Esq., M.A., F.S.A., &c.

(READ 1ST MAY, 1856.)

In a paper read at the meeting of the British Association in this town in 1854, I endeavoured to show the error of the popular notion that there was anything like uniformity of race in the population of this island when it was first visited by the Roman arms, and the more than probability that it contained Teutonic as well as Celtic blood. Of the ultimate fate of this population we are left in great uncertainty, arising not only from the deficiency of direct information on the subject, but from the different applications of the name Britons in subsequent times, when it was usually applied to the Roman population of the island, but sometimes, when given to a people independent of the Roman power, to the Caledonians of the north, who alone continued in a state of hostility to the conquerors. I am not aware that in any instance in the later Roman historians the name of Britons is applied to the remains of the peoples who inhabited our island in the time of Cæsar, and I confess that I have serious doubts if there existed any representatives of the ancient Britons to whom that name could have been applied, unless it were the servile class which was attached to the soil, and which held no place in the political history of the country, except by occasional and partial insurrections into which they were driven by oppression or by the hope of plunder. Under the government of Agricola, as we learn from Tacitus, a policy of comparative gentleness and conciliation was adopted towards the Britons, but this appears to have been abandoned under his successors, and we have every reason to believe that the older population of the island was afterwards treated with an oppressive severity, the effect of which during four centuries may easily be imagined. Among the numerous Roman inscriptions which have been found of a date subsequent to the first century, commemorative of individuals, we never find the name of a Briton.

Britain, as a Roman province, had not only changed its population, but the forms of society had changed entirely. We may form a notion best and most correctly of the mode of life and of the degree of civilization of the ancient Britons by comparing them with what we know of those of the wild Irish and of the Celtic highlanders of Scotland in the middle ages. Living in septs or clans, each collected round a petty chieftain who had his residence or place of refuge in the least accessible part of his little territory, they had no towns properly so called, and no tie of union, except the temporary one of war, or a nominal dependence on some powerful chieftain who had induced, by some means, a certain number of the smaller clans to acknowledge his sovereignty. Under the Romans, on the contrary, Britain consisted politically of a number of cities or towns, each possessing its own independent municipal government, republican in form and principle within themselves, but united under the empire through the fiscal government of the province, to which they were tributary. Each of these cities, inhabited by foreigners to the island, was expected to defend itself if attacked, while three legions and numerous bodies of auxiliaries protected the province from hostilities from without, and held it internally in obedience to the imperial government. The country was unimportant, and the towns were everything.

It is not my object on this occasion to enter into the political constitution of the cities and towns in Britain, but to speak of them merely ethnologically. In this particular case, there is a great difficulty in destroying the wrong impression made by the terms which are necessarily employed in history. If we call the people Romans, the term is correct politically, but incorrect ethnologically; and if we call them Britons, the name is incorrect both politically and ethnologically, and correct only geographically. The population of Britain during the second, third, and fourth centuries of the Christian era was neither Roman nor British, but an extraordinary mixture of all the different races who had been reduced by the arms of Rome. We have several classes of independent evidence on this point. First, that important record, the Notitia Imperii, compiled at the very close of the Roman period, gives us the titles and country of the different garrisons of the more important posts in the province at that time. We learn there that Frisians held the town or station of Vindobala on Hadrian's wall, and that Stablesians, believed to be a people from Germany, were stationed at Garriannonum in Suffolk. There were Tungrians at Dubræ, or Dover,

and at Borcovicus and Petriana on the wall; Lingones at Segedunum and Congavata on the wall; Nervii at Dictis in Westmorland, and at Alionis; Betasians at Regulbium; and Batavians at Procolitia; all from Belgium. We further find Gauls at the Portus Lemanis in Kent, at Vindolana in Northumberland, and at Glannibanta; different peoples from Spain and Portugal at Anderida in Sussex, at Magæ in Yorkshire, and at Condercum, Cilurnum, Æsica, and Axelodunum; Moors at Aballaba in the North, and another supposed African tribe at Arbeia in Westmoreland; Thracians at Gabrosentis on the wall; Dacians at Amboglanna; Dalmatians at Magna on the wall, at Branodunum in Norfolk, and at Præsidium in Lincolnshire; Fortensians, from Asiatic Sarmatia, at Othona in Essex; Crispians, from Pannonia, at Danum in Yorkshire; Solenses, from Cilicia, at Maglone.

Secondly, many inscriptions found on Roman sites in this island, confirm the statements of the Notitia, and add names of other foreign races in different parts of Roman Britain. Thus we find, from these inscriptions, Lingones from Belgium, Gauls, and Dacians, in different parts of Cumberland; a people called Cavetii at Old Penrith; Spaniards, Dalmatians, and Betasians in the neighbourhood of Ellenborough; Germans at Brougham; Tungrians, Gauls, Spaniards, Thracians, Hamii (from the Elbe), Nervii, Belgians named Cugerni, and Germans, in different stations in Scotland; Vangiones, from the banks of the Rhine, at Risingham in Northumberland; Varduli, from Spain, at Riechester and Lanchester; Thracians at Bowes in Yorkshire; Sarmatians at Ribchester in Lancashire; Frisians at Manchester; Thracians, again, at Wroxeter in Shropshire; and Thracians and Indians at Cirencester. We further learn from sepulchral inscriptions that one Dannicus, who belonged to the Indian cavalry stationed at Cirencester, was a citizen of Rauricum in Switzerland; that Sextus Valerius Genialis, of the Thracian cavalry at the same town, was a Frisian; that Titus Domitius Heron, prefect of the second cohort of Gauls at Old Penrith in Cumberland, was a native of Nicomedia of Bithynia in Asia Minor; that Crispinus Aemilius, prefect of the Ala Augusta at Old Carlisle, came from Tusdrus in Africa; that Publius Ælius, another prefect of the same Ala, was a native of Mursa in Lower Pannonia; that Marcus Censorius, prefect of the cohort of Spaniards at Ellenborough, came from Nîmes in Gaul; that an officer at York named Lucius Duccius was a native of Vienna in Gaul; that Flavius Longus, tribune of the twentieth legion at Chester, was a native of Samosata in Syria; that Nominius Sacer, an individual

buried at Lincoln, was of the city of the Senones in Gaul; that Caius Valerius, standard-bearer of the second legion at Caerleon, was a native of Lugdunum in Gaul; that Julius Vitalis, an officer of the twentieth legion, buried at Bath, was a Belgian; that Caius Murrius, of the second legion, also buried at Bath, was a native of Forum Julii in Gaul; that Caius Cornelius Peregrinus, the tribune of a cohort at Maryport in Cumberland, was a native of Mauritania; that Cornelius Victor, a soldier of the Gauls of Vindolana, was a citizen of Pannonia; and that others mentioned in the inscriptions were Greeks. It must be remembered that the information we thus obtain is very partial, and that we might perhaps have found many other varieties of race in other places in this island, if they had found a place in the Notitia, or if any inscriptions had remained. Other evidence, of a different kind but to the same purpose, such as inscriptions on pottery, &c., are also found. On a circular plate of earthenware found at Colchester we have roughly scratched the cartouche of the name of an Egyptian king, which would seem to show the presence there of Egyptians, and of an Egyptian who was acquainted with hieroglyphics.

The inscriptions, which are generally of much earlier dates than the Notitia, in combination with this record, prove that the same troops remained in each locality during the whole period of the Roman occupation, in fact that they were all virtually so many little military colonies. They show also that, whatever may have been the case at first, these different troops were not always recruited from the countries whence they were derived. It will be remarked in the list given in the Notitia, that the Germans and Belgians together were far more numerous than the others, and many circumstances lead us to believe that even the troops, or colonies, which were named after other and more distant countries were in later times recruited chiefly from the Teutonic tribes, which presented the readiest nursery of soldiers in the declining age of the Roman empire.

We are thus enabled to state that the "Roman" population of Britain consisted of a mixture of very different race, among which there was probably but little pure Roman blood and no British blood. This population was distributed in cities and towns with independent municipal governments, and most of the great landholders in the island were no doubt leading citizens in these towns. They were bound together by a common language, that of Rome, and by the adoption of Roman manners, the result of which was the feeling of a new nationality. Indeed we cannot

give a better notion of what they were than by comparing them with the British settlements in America, while these remained dependent upon the mother country, bearing in mind that the variety of race was much greater in the one case (that of Roman Britain) than in the other. Even the Roman legions, whose duty it was to keep the island in subjection, exhibited in later times the same diversity of race, and we find them actually making common cause with the towns, in their rebellions against the superior government.

One of the great vices of the Roman rule was the oppressive taxation of the provinces, which led not only to general rebellions of all the towns united, but apparently to frequent cases of resistance to the imperial authority by single towns, or by two or three towns in confederacy; and in such cases the rebels invoked the assistance of the German and Northern pirates, and even called in the aid of the still wilder peoples of Caledonia. There was moreover hostility between different towns, arising sometimes from difference of race and partly from commercial or other rivalry, which doubtless contributed no little to the turbulence of this distant province. In Gaul, the history of which is much better known, we trace more plainly these rivalries of the towns, and see how they sometimes degenerated into deadly hatred. In Britain, unfortunately, in consequence of the very limited information which remains, we can only trace its existence by implication. Thus, soon after the middle of the fourth century, when the island province was delivered from the ravages of the Picts, Scots and Saxons, by the imperial general Theodosius, the way in which the historian Ammianus Marcellinus speaks of the event is such as to leave no doubt on our minds that the joint invasion had been encouraged, if not prompted, by the rebellious towns, and that the primary cause of their rising was the inattention of the emperor Valentinian to their complaints of oppressive taxation. A few years later, in 383, the islanders entered into a still more formidable rebellion, and proclaimed Maximus emperor, who carried the troops of Britain over to the Rhine, where he was immediately joined by the Germans. In the beginning of the fifth century, we again find the cities of Britain revolting, when they conferred the title of emperor on a man named Marcus, whom they slew in 407, and chose in his place a person named Gratian, who is distinctly stated by the historian to have been a *municeps*, or burgher of one of the towns, of Britain. They let him reign four months, and then put him to death, and chose another man, named

Constantine, to be emperor. This man, possessed of more vigour and talent than his two unfortunate predecessors, imitated the example of Maximus, and, crossing over to the continent, found there sufficient sympathy to enable him to usurp for a time the empire in the West. After this usurper's departure from the island with, no doubt, great part of the legionary troops, the towns in Britain governed themselves, and protected the province so effectually, that they drove away the Saxons, who had seized upon the occasion to invade it; and when the usurpation of Constantine was suppressed, the cities of Britain retained their independence. Very soon after this, in the year 410, the emperor Honorius addressed letters to the cities of Britain, telling them to do what in fact they were already doing,—to provide for their own safety; and he thus acknowledged their independence.

The Roman population of Britain appears to have been, when united, capable of doing all that the letters of Honorius recommended to it, and the province does not appear to have been weakened by being cut off from the empire, or to have been immediately exposed to the attacks of external enemies. But tradition confirms what appears to be implied by history, that the towns of Britain soon became involved in domestic dissensions and civil wars. We are assured by the later Roman writers that the officers and leading men in the towns in Britain were remarkable for their ambition and love of intrigue; they had now the liberty as well as the inclination to act, and we can easily see, through the obscurity of history at that time, confederacies and counter-confederacies among the towns, in which the old commercial rivalries as well as ambition would play a part, and which led to civil wars and confusion; and it was then that the external enemies, as well Jutes, and Saxons, and Angles, as Picts, and Scots, and Irish, and others, were induced by the prospect of plunder or by the invitations of the contending parties to rush into the province.

The Roman towns were still strong, although they had lost the unity which made the strength of the island, and it took years to reduce them all under the power of the Teutonic invaders, who thus established themselves gradually. The brief story of the Saxon invasion told in the Saxon records is that of the successive reduction, sometimes at rather distant periods, of the Roman towns to their obedience. The Teutonic settlers were a race who, like the ancient Britons, were not accustomed to live in towns, and were in fact prejudiced against them, and wherever they took one by storm or

entered it unconditionally, they plundered and destroyed it. But the larger fortified towns were not easily taken, and the greater number, after unsuccessful attempts at resistance in the field, appear to have yielded upon composition. The ambition of the great chiefs of the conquering race, who soon became emulous of Roman civilization, could not be otherwise than flattered at possessing towns where the articles of Roman ostentation and luxury were manufactured, and when they aspired to form kingdoms, the prospect of an annual revenue in the shape of tribute would restrain the otherwise natural eagerness for present plunder. Antiquarian discovery is continually confirming what many circumstances would lead us to believe, that, while the whole land without was distributed among the Anglo-Saxon conquerors, the original Roman population of which I have been speaking, formed at first from various races, but afterwards recruited chiefly from Germany and Gaul, remained in the towns, coexistent with the new Anglo-Saxon lords of the soil, and still retaining their municipal forms and institutions and their Roman manners, until these became gradually more and more assimilated to those of the Saxons, a change which would be facilitated by the prevalence of Teutonic blood in the towns themselves. The natural antagonism which must have remained between the townsmen and the conquerors continued to exist through the middle ages, and has even reached our own times in a certain sort of rivalry between town and country. I need only add, that to this preservation of the towns, we owe our municipal corporations of the middle ages.

The conclusions I would draw from these considerations are, that at the close of what is called the Roman period of the history of Britain, the remains of the original Celtic population were very small, and perhaps consisted chiefly or entirely of the peasantry who cultivated the land as serfs. Further, that the "Britons" who struggled against the invasions of the Picts and Scots and Saxons were a mixture of races foreign to the island, and lived congregated in towns, and that when the Anglo-Saxons at last obtained the ascendancy, the remains of this population continued to exist among them, and became part of the Saxon States, while the peasantry probably continued to exist in the same servile condition as before. In fact, that the popular story that the people who resisted the Saxons was the ancient Celtic population of the island, and that it retired before the conquerors until it found a last refuge in Wales, is a mere fiction. It may be added that these conclusions are in perfect conformity with what is known

to have taken place in other countries similarly situated. If we cast our eyes over a map of Saxon England during the sixth or seventh century, we shall see that the only towns of any importance then existing were actually the great Roman municipal settlements. To mention but a few, we have, first, the chief town in the island, London; to the South-east of it, Canterbury and Rochester, with the old Roman port towns; to the North-east and North, Colchester, Leicester, Lincoln, Doncaster, York, Carlisle, with one or two towns in Lancashire; and Chester. Westward and Southward of London, we find the important towns of Chichester, Winchester, Old Sarum, Dorchester, Exeter, Bath, Cirencester and Gloucester. Between the historical notices of the Saxon chronicle, and the known continued existence of these towns, we can trace the advance of the Saxons from town to town, as each submitted itself to their supremacy.

I cannot resist the occasion, while on this subject, of pointing out a circumstance connected with it, which has, I think, a meaning that has not yet been discovered. As we trace the advance of the three great divisions of the Anglo-Saxon race in their progress of conquest and settlement, and examine the Roman sites over which they passed, we perceive the smaller towns and the country ravaged and destroyed, while, as I have said before, the larger towns saved themselves from destruction. Now if we look into Wales, which was certainly as completely subjected to the Roman government as any other part of the island, and which we find covered with Roman towns, roads, and settlements, which reached even into the wilds of Snowdon, the same scene of devastation presents itself—even to a greater degree, for while we find Roman towns scattered over Saxon England, we do not find that a single town to the West of the Severn escaped destruction. The strong town of Deva, or Chester, held its ground to the North, and Glevum, or Gloucester, survived, and a Roman town on the site of Worcester, may also have been preserved, but the line of strong towns between Gloucester and Chester—Ariconium, Magna, Bravinium, Uriconium—a number of important towns in South Wales, with Isca, or Caerleon, the station of the second legion—and other no less important towns on the Western and Northern coasts and in the interior,—all these are found to have been utterly destroyed. As this destruction was certainly not the work of the Anglo-Saxons, although it must have taken place during the period of the Saxon invasion, to whom may we ascribe it? If, according to the common story, the "Ancient Britons,"

withdrawing from before the Saxons, had made their last stand in Wales, and found there a place of safety, it seems absurd to suppose that they would have destroyed the towns and country which were to have been their protection. In fact I think that the circumstance I have just mentioned is sufficient in itself to contradict the old story, and that it seems to imply that, contemporary with the invasions of the Saxons and Angles, and the irruptions of the Picts and Scots in the North, Wales itself was visited by a similar and even more fatal invasion. If we further compare the circumstances of the two cases, it seems to me that we are led very strongly to the supposition that the Welsh may be settlers on the ruin of the Roman province on their side of the island, just as the Saxons and Angles were in England, and the Northern invaders in the districts of the south of Scotland. I know that many will be startled at so bold a theory, but I would wish it to be clearly understood that I merely offer it as a suggestion arising out of the consideration of the circumstances of which I have been speaking, and as deserving a fair and careful examination. It may be asked, if the Welsh are not ethnologically what they are commonly represented to be, who are they, and whence did they come? Our total ignorance of the history of the period to which this question refers, as far as regards them, renders it impossible to give any certain answer to it, but we might naturally turn our eyes towards Britany (Armorica), a country which in consequence of its physical character and condition, and from other causes, was never completely Romanised; in which, at the time of which we are speaking, there was apparently a tendency if not a necessity to emigrate; and the Celtic population of which, holding fiercely to their old nationality, were also, from that same position, accustomed to navigation, which was then equivalent to piracy. They might, likely enough join in the scramble for the plunder of Britain. It is unfortunate for the clearing up of this question, that much of what is considered as the history of Britany, during this period, consists of mere modern interpretations of late legends. At the beginning of the fifth century, the Armoricans had recovered their independence, resumed their ancient barbarism, which indeed they can hardly be said to have ever abandoned, and formed a sort of republic of chiefs of clans. We can, however, perceive by the slight notices of the authentic chroniclers, that the Armoricans, become independent, joined in the general spirit of aggression which urged the barbarians to the invasion of the Roman province of Gaul, and that subsequently, when Aetius directed

the Roman arms in Gaul, and just at the time of the Saxon invasion of Britain, the Armoricans themselves were closely pressed and partially subdued, and placed indeed exactly in that condition in which emigration would have attractions for its ambitious and turbulent chiefs. Britain alone offered any field for their activity. Moreover, we suddenly discover at this time a more intimate connection between Armorica and that island.

We can understand, if this were the case, why a people who had far less intelligence for the application of the advantages of civilization than the Saxons, destroyed all that remained of it, and as settlers, took to their own wilder way of living. I confess that there are some difficulties in the way of this solution of a very difficult question; but, at the same time, if it could be proved to be the true one, it would clear away other difficulties which are still more embarrassing. People speak of the so close resemblance between the languages of Britany and Wales, that I have seen and heard it stated by men who are understood to have known both languages well, that a Breton of the present day might hold conversation with a Welshman. Philologists know that such a close similarity as this is hardly within the range of possibility, after the natural changes which all languages undergo in so great a length of time;—if Welsh were historically the representation of a language spoken in Britain in the time of Cæsar, and Breton the similar representation of the language of ancient Gaul. Whereas, if we could suppose that Welsh was Breton, separated from it at the close of the Roman period, and therefore not having experienced the long intervening influence of Roman civilization, the close similarity of the two languages is much more easily understood. Moreover, I have always felt convinced that the mediæval legends of Wales were essentially Breton, and that all the romance literature to which they gave rise was derived from Armorica, and at the same time felt the difficulty of explaining a certain degree of relationship which they seemed to have with the minds and sentiments of the Welsh themselves, a difficulty which would disappear at once before such an explanation. The legends connected with the romance-cycle of king Arthur have always appeared to me to represent the mythic genealogy of the Celtic race as preserved in Armorica, and all our authentic information on the subject represents it as being introduced from thence into our island in the twelfth century. We must not forget that the *Historia Britonum* of Geoffrey of Monmouth was avowedly founded upon a Breton manuscript. Again, we know from what

is observed in other countries, where we are better acquainted with the early social progress, how soon a race in its emigration attaches to its new home the legends and traditions which really belong to the country it has left. These, combined afterwards with a few traditions of a more historical character, form what is usually called the fabulous or heroic period of a nation's history.

However, the present is not the occasion for entering upon this part of the subject, and I shall content myself with stating the suggestion which appears to me worthy of careful consideration. I will only add that a friend, who is profoundly versed in that part of the subject, has remarked to me, since this paper was first read, that he has always considered that a class of inscriptions found in Wales, and belonging apparently to the period subsequent to that of the Roman occupation, which resemble nothing of the sort found in other parts of England, present an analogy with the inscriptions of the same kind found in Britany, and with those only.

My object on the present occasion is more especially to enforce as strongly as I can, upon ethnologists, the necessity of paying constant attention to the historical materials of their science. That branch of it which may be conveniently and properly termed craniography, is at the present time making great advances, and at the same time it is a branch which requires to be treated with extreme caution. Of course we must find our crania in the graves, or, as they are in our island usually called, the "barrows," of the races which are under our consideration. When we have to deal with the well-known burial places of particular races, the subject is clear and simple; but this is not always the case, especially in Britain. I have endeavoured now to make clear to you, the extreme diversity of race which existed in this island under the Romans; and, in a paper which I wrote on a former occasion, and for another purpose, I gave reasons for believing that there was far from uniformity of race before the Romans placed their feet on our soil. Nevertheless, if we could place our hands on barrows or graves in this country, and say with certainty that these belonged to the ante-Roman period, we might still classify them according to their districts, and probably derive from the examination of them certain ethnological facts. But unfortunately this is not the case, and I do not believe that there has yet been found a grave in the island to the south of the Forth and Clyde, which you can venture absolutely to declare to have been older than the Roman period, or even to be that of a Celt. It is true

that there are one or two localities, such as the downs of Wiltshire, in which *probability* is in favour of the interments being Celtic, but this is still far from certain, and it would not be safe to found a system upon it. My own impression is, that we shall arrive at no important ethnological results from the mere examination of the skulls found in England in interments older than the Anglo-Saxon period; owing to the variety of races who had lived in the island contemporaneously or at different periods, and the impossibility of identifying the particular race to which any one interment belonged. With regard to the Anglo-Saxon cemeteries, there can be no doubt that they represent known races, and divisions of those races, and we can enter upon the investigation of them with certainty as to the foundation on which we build, and therefore with tolerable certainty as to the results. To these, therefore, as they may be rendered available to science in the course of future excavations, I would especially invite the attention of the craniographer, in the certainty that his labours will not be altogether thrown away. The opportunity of observation has already been lost in too many cases, but I believe that I can safely promise, that within a short period, new and favourable opportunities will occur, and I feel confident that they will not again be neglected. I trust that, now that the importance of such collections is becoming more generally known, many Saxon cemeteries from different parts of the island will pour in their contributions to our ethnological museums; while I would with equal care collect and examine the skulls from burials which are not Saxon, specifying their locality and the circumstances under which they were found, without calling them Celtic, or Roman, or by any other name, unless its appropriateness be very clearly ascertained.

ON THE LEPIDOPTEROUS INSECTS OF THE DISTRICT AROUND LIVERPOOL.

By Charles Stuart Gregson.

(Read 21st February,* 1856.)

In preparing this list, I have arranged the species in the position in which they would stand, in the great world of Lepidoptera. All who have gone before me have prepared their local lists as if there were not any other countries where Lepidoptera abound. This will explain the seeming irregularity of passing from Group "one" to "three" or "five" in a Genus, or of commencing a Family or Genus at "two," "four" or "six."

Part I contains the Diurnal Lepidoptera.

Part II the Sphingidæ and Bombycidæ.

Part III (previously printed) the true Noctuidæ, and

Part IV the Pyralidæ.

I propose that Part V shall include the whole of the Geometridæ.

Part VI, the Tortricidæ, and

Part VII, the Crambidæ and Tineidæ.

Omitted from Part III, Section 4.

Genus Miana, St.

M. erratricula, Hb.—Plentiful on flowers on the coast at dusk. July and August.

Genus Mania, Tr.

Group 2.

M. maura, Lin.—Plentiful on sugar in August. Hale and Croxteth.

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* The former portion of this paper is printed; Transactions volume vii. pp. 237-254.

PART I.

Class INSECTA.

Order LEPIDOPTERA.

Section 1. RHAPALOCERA Bdv.

PAPILIONIDÆ.

FAMILY 2. PIERIDÆ.

Genus PIERIS, Bdv.

P. Brassicæ, Lin.—Abundant about Gardens. Larva on Cabbages, particularly in September and October.

P. Rapæ, Lin.—In profusion about gardens in summer.

P. Napi, Lin.—Plentiful at Linacre and Garston.

Genus ANTHOCHARIS, Bdv.

A. Cardamines, Lin.—Abundant from Allerton to Hale, and plentiful in the district between Crosby, Sefton, and Lydiate; a few may be met with in the swampy parts of Wirral, on the wing. April and May.

Genus LEUCOPHASIA, Steph.

L. Sinapis, Lin.—In a rough plantation between Hooton Station and Mollington. May.

Genus GONEPTERYX, Leach.

RHODOCERA, Bdv.

G. Rhamni, Lin.—Mr. Nixon took it at Hale in April. I took it at Simonswood in the end of July.

Genus COLIAS, Bdv.

C. Edusa, Lin.—I have seen three specimens captured within this district; —one by T. Dean, in Pigue Lane; one by Mr. Cauty, at New Brighton; and one by a non-collector, at Saughall Massey. August and September.

FAMILY 3. LYCÆNIDÆ.

Genus THECLA, Fab.

T. Quercus, Fab.—I have taken this species in a piece of rough ground beyond Eastham. The Chester railway crosses this fine collecting ground. End of July and August.

T. Rubi, Fab.—Jackson's Wood, Hargreave Hall, and Sutton, Hale and Lydiate. Local. May.

Genus CHRYSOPHANUS, Hub.

LYCÆNÆ, Och. POLYOMMATUS. Bdv.

C. Phlæas, Bdv.—Generally distributed, the finest specimens between Bootle and Walton, in August.

Genus POLYOMMATUS, Steph.

LYCÆNA, Bdv.

P. Argiolus, Bdv.—Taken around Eastham and Hooton, by T. Harris, Esq., and at Hale, by Mr. Nixon. May.

P. Alsus, Fab.—Two specimens by myself, at Neston. Several between Rainhill and Ditton. Early in June.

P. Ægon, Bork.—Plentiful on dry heaths, particularly on Bidston Hill in July.

P. Alexis, Fab.—In profusion on the sand hills and on the railway banks at Olive Mount.

FAMILY 4. ERYCINIDÆ.

Genus NEMEOBIUS, Steph.

N. Lucina, Steph.—I have taken a few specimens of this species at the place at which I got Thecla Quercus. End of May.

FAMILY 6. NYMPHALIDÆ, Swa.

Genus ARGYNNIS, Och.

A. Aglaia, Och.—Plentiful a few years ago at New Brighton; a few specimens may still be seen at this side of the Red Noses; not scarce from Little Brighton to Hightown, on the Lancashire coast, in July.

A. Euphrosyne, Och.—Not scarce in the rough woods beyond Bromborough. May.

Genus MELITÆA, Fab.

M. Artemis, Fab.—Plentiful from Maghull to Lydiate, particularly on the canal bank. May.

Genus VANESSA, Fab.

V. Cardui, Fab.—Plentiful where its food abounds; its larvæ may be detected upon the thistles by the discolouration of the lower leaves. Flies in Spring and August.

V. Atalanta, Fab.—Plentiful where nettles grow. September.

V. Io., Linn.—Abundant, larvæ gregarious on nettles. Spring, July, and August.

V. Urticæ, Linn.—Larvæ in profusion on nettles.

V. C. album, Fab.—Hooton, Hale, Woolton, not plentiful; one in my garden September 12, 1854.

FAMILY 9. SATYRIDÆ.

Genus SATYRUS, Bdv.

S. Semele, Linn.—Abundant on waste lands in July and August.

S. Janira, Och.—Common in pastures. June.

S. Tithonus, Linn.—Plentiful on sandy banks in lanes. July.

S. Megæra, Linn.—In lanes everywhere in Summer.

S. Ægeria, Linn.—Taken from Bromborough to Eastham, by Mr. Edmondson, on the high road. April.

S. Davus, Fab.—In profusion on Simonswood moss. June.

S. Pamphilus, Linn.—Common on unenclosed grounds.

FAMILY 10. HESPERIDÆ, Bdv.

Genus PAMPHILA, Steph.

(HESPERIÆ AUCT.)

P. linea, Fab.—A single specimen taken by myself, July, 1841, is the only instance of its capture in this district, that I am aware of. I took it near Gill Brook, Birkenhead.

P. sylvanus, Fab.—Is abundant on Simonswood moss, and plentiful upon Crosby sand hills, in May.

Genus THANAOS, Dup.

T. Tages, Linn.—In profusion in the same localities as Pamphila sylvanus.

End of Part I.

PART II.

SECTION 2. HETEROCERA, Bdv.

FAMILY 2. SESIARIÆ, Bdv.

Genus TROCHILIUM, Sco.

SESIA, Lasp. ÆGERIA, Fab.

T. Tipuliformis, Leach.—Taken at Hale Hall garden by Mr. Almond, and at West Derby by B. Cooke, Esq.

FAMILY 3. SPHINGIDÆ.

Genus ÆGERIA, Fab.

Æ. Bombyciformis, Hub.—May be taken on poplar trees at Birkenhead, before 11 a.m.; it sits on the trunk of the tree. I have naturalised this species around Old Swan and Highfield. I placed the eggs on various poplars and willow trees ten years ago; it is now an abundant species here.

Genus SESIA, Fab.

S. Bombyliformis, Fab.—I have only seen one specimen; it was taken at Bidston. One by Mr. Leyland from same locality. (Mr. Almond.)

Genus MACROGLOSSA, Och.

M. Stellatarum, Och.—Plentiful on Wallasey and Crosby sand hills; flies on the highest hills when the sun is hottest. Larvæ on Galium verum.

Genus DEILEPHILA, Och.

D. Porcellus, Linn.—Plentiful flying over yellow Iris flowers, and over catch-fly flowers, about the coast. Dusk. May and June.

D. Elpenor, Linn.—May be taken with Porcellus. Larva on E. hirsutum in August.

GROUP 2.

D. Euphorbiæ, Och.—A specimen of this species taken in an out-house at Bidston, by W. Morgan, is now in my cabinet; two of its larvæ have been taken between Little Brighton and Hightown, from Euphorbia Paralias.

D. Galii, Fab.—A specimen taken by Mr. Rainford, between Bootle and Linacre Marsh.

D. lineata, Fab.—I possess a fine specimen taken by F. Hitchmough, at Hale, April, 1847.

Genus SPHINX, Linn.

S. Convolvuli, Linn.—Oxton Hill, Liscard, Hale, and New Brighton, over petunias and hollyhocks. Dusk.

Genus ACHERONTIA. Och.

A. Atropos, Och.—Hale, Bidston, and Bootle, on potatoes; 17 bred by W. Rainford; fed upon *Lycium lanceolatum*.

Genus SMERINTHUS, Lat.

S. Ocellata, Linn.—Plentiful under overhanging banks at New Brighton, in June; larva on sallows in August.

S. Populi, Linn.—Plentiful where Ontario poplars grow, in June; larva in August.

FAMILY 4. ANTHROCERIDÆ, West.

Genus ANTHROCERA, Scop.

A. Trifolii, Esp.—In profusion on Hale Marsh. June.

A. ——— ?—A 5 spot, Loniceræ? near St. Helens, on a dry hill-side on the road to Eccleston.

A. Filipendulæ, Linn —Common on waste lands and about old pastures.

Genus PROCRIS, Fab.

P. Statices, Fab.—Hale Marsh, the Dungeon, and below Crosby. June.

FAMILY 5. LITHOSIDÆ, Steph.

Genus EUCHELIA, Bdv.

E. Jacobæa, Linn.—Plentiful on the coast and upon the mosses, in June. Larvæ on Senecio Jacobæa, July.

Genus LITHOSIA, Fab.

L. Rubricollis, Fab.—I have bred this species from pupa in moss about Jackson's Wood, and Bidston.

L. complana, Linn.—Simonswood Moss; two specimens taken on the wing at dusk; others seen end of July, 1851.

L. Complanula, Bdv.—Plentiful around West Derby, where beeches grow. Larvæ on beech trunks when covered with Lichen ———?

L. Mesomella, Linn.—I meet with this insect sometimes in a wood between the Little Britain inn and Simonswood Moss. June.

Genus NUDARIA, Haworth.

N. Munda, Linn.—Abundant from Tranmere Hall to Prenton, in June; feeds upon Lichen on old stones. Bred freely by Mr. Almond.

FAMILY 6. ARCTIDÆ, Leach.

CHELONIDES, Bdv.

Genus NEMEOPHILA, Steph.

N. Russula, Linn.—In the swampy ground in Jackson's Wood, and at the Decoy at Hale. July.

N. Plantaginis?—Prenton Hill and Stourton; flies before noon.

Genus ARCTIA, Steph.

GROUP 1.

A. Caja, Linn.—Abundant in the larva state in lanes.

GROUP 2.

Genus PHRAGMATOBIA, Steph.

P. Fuliginosa, Linn.—Common on waste lands. May and August.

GROUP 3.

P. Lubricepeda, Fab.—In profusion about gardens in June.

P. Menthastri, Fab.—In lanes and gardens; common.

P. mendica, Linn.—About dirty gardens in Wirral, where chick weed grows freely, particularly if there are lettuces growing amongst the chick weed.

FAMILY 7. LIPARIDÆ.

Genus LIPARIS, Och.

GROUP 3.

L. Salices, Och.—Larvæ plentiful at Crosby; feeds upon Ontaria poplar in May.

GROUP 4.

L. Auriflua, Fab.—Larvæ abundant in the thorn hedges at Bidston and Wallasey, in July.

Genus ORGYIA, Och.

GROUP 1.

O. Cœnosa, Hub.—My friend, T. Townley, first discovered this species at Altcar, and afterwards at Bidston Marsh. Larva on reeds in May.

GROUP 2.

O. pudibunda, Och.—Plentiful near woods and plantations.

O. fascelina, Och.—Larvæ in profusion on the sallows at Crosby, in April and May.

O. Coryli, Och.—A few bred from larva, taken at Croxteth Park.

GROUP 3.

O. antiqua, Och.—Abundant throughout the district, on the wing. August and September.

FAMILY 8. BOMBYCIDÆ.

Genus CLISIOCAMPA, Curtis.

C. Neustria, Linn.—Plentiful from Upton to West Kirby. July.

Genus ERIOGASTER, Germar.

E. Lanestris, Germ.—Larvæ plentiful on dog rose and thorn, about old pits in Wirral. May and June.

Genus PŒCILOCAMPA, Steph.

P. Populi, Linn.—Bidston Light House, and at lamps in West Derby. October and November.

Genus LASIOCAMPA, Steph

L. Rubi, Linn.—Common on heaths and waste lands. May.

L. Quercus, Schr.—Plentiful at the same places as Rubi. June and July.

L. Trifolii, Fab.—Larvæ abundant in May at New Brighton and at Crosby; perfect insect in August.

Genus ODONESTES, Ger.

O. potatoria, Germ.—Common in lanes.

FAMILY 9. SATURNIDÆ.

Genus SATURNIA, Sch.

S Carpini, Bork.—Plentiful on heaths and mosses. April and May.

FAMILY 11. ZEUZERIDÆ.

Genus COSSUS, Fab.

C. Ligniperda, Fab.—Has been taken all around the district.

HEPIALIDÆ, Steph.

Genus HEPIALUS, Fab.

H. Humuli, Linn.—Common on grass land in June.

H. Velleda, Esp.—Wood near Simonswood Moss, on honey-suckle in July.

H. sylvinus, Linn.—Liscard and New Brighton; on the wing at dusk in July.

O. lupulinus, Fab.—Abundant in old lanes. June.

H. Hectus, Fab.—In damp woods; flies about at 7 o'clock, p m., at Bromborough, Hale, and Croxteth. June.

FAMILY 14. DREPANULIDÆ.

Genus CILEX, *Leach.*

C. spinula, W. V.—Plentiful in lanes. June.

Genus PLATYPTERYX, LASP.

GROUP 1.

P. lacertula, Esp.—Birch Wood, and near Simonswood Moss.

GROUP 2.

P. falcula, Hub.—Common where Lacertula is taken. May and June.

FAMILY 15. NOTODONTIDÆ.

PSEUDO-BOMBYCINI, Boisd.

Genus CERULA, Sch.

C. bifida, Hub.—Prenton Wood and Wallasey, on poplar trees. May.

C. Vinula, Sch.—Plentiful where poplars and willows grow. May.

Genus NOTODONTA, Och.

GROUP 1.

N. camelina, Och.—Larvæ plentiful on sallows in the pleasure grounds at Bidston, in September; also on birches.

GROUP 2.

N. dictæa, Och.—Larva on sallows and poplars; perfect insect; comes to lights.

N. dictæoides, Esp.—Comes to Bidston Light House on dark nights in July. Larva on *birch* August and September.

GROUP 3.

N. Dromedarius, Och.—I take its larvæ at Simonswood and at Birch Wood, by beating in September.

N. ziczac, Linn.—Larva on willows on the coast. September.

GROUP 5.

N. chaonia, W. V.—First taken by B. Cooke, Esq., on a gate-post at Eastham. Two at Hooton by T. Harris, Esq. April.

Genus DILOBA, Boisd.

D. cæruleocephala, Linn.—Common at lamps in Autumn. West Derby.

Genus PYGÆRA, Boisd.

P. bucephala, Linn.—Larvæ common on oaks and willows in August.

Genus CLOSTERA, Hoff.

C. Reclusa, Fab.—One specimen taken at the old wood in Kirkby, is all I have seen in this district.

End of Part II.

PART III.—See Vol. vii. p. 242.

PART IV.

SECTION 6.

HETEROCERA.

DELTOIDÆ.

FAMILY 2. HYPENIDÆ, H. S.

Genus HYPENA, Schrank.

GROUP 3.

H. probosidalis, Och.—Abundant in stables.

Genus HYPENODES, Gn.

H. costæ-strigalis, St.—Plentiful on Prenton and Bidston Hills. Comes to sugar in July.

FAMILY 3. HERMINIDÆ, Dup.

Genus RIVULA, Gn.

R. sericealis, W. V.—Hut of Hut's Wood, Hale. May and June.

Genus HERMINIA, Lat.

GROUP 4.

H. tarsicrinalis, Knock.—Taken by W. Skellon at Green Bank.

H. Grisealis, W. V.—Not uncommon in Bidston Plantation, and plentiful at Kirby Old Wood, and at Hale.

GROUP 7.

H. cribralis, Hub.—Specimens taken by Mr. Nixon, at or near Hale.

SECTION 7.

PYRALIDÆ.

FAMILY 1. *Genus* PYRALIS, Linn.

GROUP 2.

P. farinalis, Linn.—In profusion in granaries.

GROUP 3.

P. glaucinalis, Step.—One taken at Hale Bank is in my cabinet.

Genus AGLOSSA, Lat.

A. pinguinalis, Lat.—Plentiful in old stables.

SECTION 8.

LUBIDÆ, Gn.

FAMILY 2. ENNYCHIDÆ, Dup.

Genus PYRAUSTA, Sch.

P. punicealis, W. V.—Lydiate. Scarce.

P. purpuralis, Curt.—Sutton, Parkgate, and Ditton.

P. ostrinalis, Curt.—Plentiful on the sand hills.

Genus RHODARIA, Gn.

R. sanguinalis, Linn.—Wallasey sand hills, where wild thyme grows. Evening, June.

Genus HERBULA, Gn.

H. cespitalis, W. V.—Not scarce on the Cheshire coast sand hills.

Genus ENNYCHIA, Tr.

E. cingulata, Step.—Plentiful, but local, on the Wallasey sand hills; flies about 5 p.m. May and August.

FAMILY 5.

HYDROCAMPIDÆ, Gn.

Genus CATACLYSTA, H. S.

C. Lemnalis, H. S.—In every old pit.

Genus PARAPONYX, Steph.

P. Stratiotalis, Step.—May be found in a large pit behind New Brighton, on the lower side, opposite the stile road to Wallasey Church; is also in a round pit on Bidston Marsh. Flies at dusk, June.

Genus HYDROCAMPHA, Lat.

H. Nymphæalis, Step.—Abundant around pits. June.

FAMILY 8. BOTYDÆ, Gn.

Genus BOTYS, Lat.

GROUP 4.

B. Fuscalis, W. V.—Plentiful on Bidston Marsh. June.

GROUP 5.

B. Urticalis, Steph.—Abundant at Liscard, and pupæ plentiful on white poplar, under loose bark.

Genus EBULIA, Gn.

E. crocealis, Tr.—Woods around Kirkby, Eccleston, and Lydiate. June.

E. Sambucalis, Albin.—Plentiful at Wallasey, Ford, and Linacre, in garden hedges.

Genus PIONEA, Gn.

GROUP 2.

P. forficalis, Linn.—May be bred from larvæ found in curled leaves of Silene inflata, in May.

Genus SPILODES, Gn.

GROUP 2.

S. sticticalis, Linn.—Two specimens taken by N. Cooke, Esq., and five specimens taken by R. S. Edleston, Esq., at Wallasey sand hills, are all that have yet been taken here. July, in the sun.

Genus SCOPULA, Sch.

GROUP 1.

S. lutealis, Haw.—Abundant about ditches; bred from Silene inflata. June.

GROUP 2.

S. olivalis, W. V.—Plentiful in damp places, particularly in woods.

S. Prunalis, W. V.—Abundant on Bidston Marsh and at Hale. June.

GROUP 4.

S. Ferrugalis, Hb.—I once met with this species in a clump of trees, at the bottom of Mrs. Peacock's garden, at Saughall Massey. I have not heard of it in any other locality.

SCOPARIDÆ, Gn.

Genus STENOPTERYX, Gn.

S. hybridalis, Hb.—Plentiful on Bidston Marsh, and on the sand hills.

Genus SCOPARIA, Haw.

GROUP 2.

S. ambigualis, Tr.—May be taken at Jackson's Wood, and at Birch Wood. July.

S. cembralis, Haw.—Neston and Woodchurch. June and July.

S. muralis, Curt.—Prenton Hill. June.

S. mercuralis, Haw.—Bidston Hill and Fir Grove. End of May.

S. truncicolalis, Sta.—Prenton Wood. July.

S. frequentalis, Sta.—Bidston, Edge Lane, and Green Bank. End of May.

S. disputalis, Greg. N.S.—Simonswood Moss. May. This distinct species is nearest allied to Frequentalis, Sta., and Mercurialis, Haw., but is readily distinguished from both these species, by its more suffused

appearance, the first fascia being less sharply defined, and the outer fascia more acutely bent outwards, the upper wings broader, and the under wings lighter, than in either of the above insects. Plentiful.

S. resinalis, Haw.—Fir Grove, Croxteth, and Allerton Hall. May & June.

S. coarctalis, Zell.—Plentiful throughout the district. Summer.

GROUP 3.

S. palidulalis, St.—Bidston Marsh, and on the wet land below Crosby, Simonswood, and other mosses.

End of Part IV.

ABBREVIATIONS OF AUTHORS REFERRED TO.

Alb.	Albin's Natural History of English Insects. London, 1724.
Bdv.	Boisduval's Europæorum, Lepidopterorum. Paris, 1840.
Bork.	Borkhausen Europaischen Schmetterlinge. Franckfurt, 1792.
Cl.	Clerck James, Insectorum Rariorum. 1764.
Curtis or Curt.	Curtis' British Entomology. London, 1823-1840.
Dalm.	Dalman Anatecta Entomologica. 1823.
De Geer.	De Geer. History of Insects.
Dup.	Duponchel. Natural History of Insects, and Catalogue. 1844.
Esp.	Esper. Die Schmetterlinge in Abbidungen nach der natur. 1786.
Fab.	Fabricius Entomologia Systematica. 1793.
Ger.	Germar. Magazin der Entomologia. 1813-1821.
Gn.	Gnenée. Essai sur les Noctuélites, &c.
Haw.	Hawarth Lepidoptera Britanica. 1803.
Hb.	Hubner Sammlung Europaischer Schmetterlinge. 1796.
Lat.	Latreille Gen. Crustaceorum et Insectorum. Paris, 1806-1809.
Linn.	Linne Systema Naturæ. 1767.
Och.	Ochsenheimer Systema Glossatorum Europæ. 1811.
H. S.	Herrich Schoeffer. 1844 to 1846.
Sch.	Schrænck Fauna Boica. 1801.
Scop.	Scopoli Entomologia Carniolica. 1763.
St. or Steph.	Stephen's Illustrations of British Entomology. 1829.
Tr.	Treitschke Schmitterlinge von Europa. 1825-1826.
Westw.	Westwood. Westwood and Humphry's Butterflies and Moths. 1841-1845.
W. V.	Wiener Verzeichniss. 1801.

ON THE AREA AND POPULATION OF THE MANCHESTER DISTRICT.

By J. T. Danson, Esq., F.S.S., Vice-President.

(READ 14TH FEBRUARY, 1856.)

Near Manchester there are fifteen other towns*, so connected with it by the manner in which all have come into and are kept in existence, that I see no way of dealing with them asunder, and justly. Hence I say "the Manchester District"—not "Manchester."

OUTLINE.

A circle having Manchester in its centre, and a radius of about fourteen miles, would include all these towns and their suburbs. But the district is not circular, nor is Manchester, in a geometrical sense, even near its centre.

Were the district described by a line drawn round the entire group of towns, and passing at a minimum distance of five miles from the centre of each of the outer ones, its greatest length would be on a line nearly due east and west, from Leigh through Manchester and Staleybridge—about twenty-nine miles. And the area of the district thus described would be about 341 square miles, or 218,240 acres.

The divisions of the surface now in use for enumerating the population

* To the word "town" I here attach this meaning, and no other, viz.,—that of an area, great or small, inhabited, permanently, by a minimum number of persons, whose number, in relation to the area occupied, affords an average density not below another minimum. In this instance, the minimum number is 2000 persons. The minimum density is ten persons per acre. Thus I call Atherton a town, because, on 250 acres of ground, I find there, in 1851, 2,780 persons. And I call Eccles a town, because on 325 acres, I there, at the same date, find 4,108 persons. In a previous paper, on the population of Liverpool and its environs, I have distinguished town from suburbs. Here this distinction is not marked. It was not necessary to the purpose in view; and would, if attempted, have involved a serious addition to the labour of the gentleman to whom I am indebted for the computations on which the greater part of the present paper is based. So much for the guidance of the reader; and not more, I am assured, than is needed. If he can form a better definition of a town than the one here used I shall be glad to hear from him.—J. T. D.

of this area do not coincide exactly with the boundary thus assumed. But the difference is not great. If we take all the Parishes and Townships, considerable portions of which lie within the assumed boundary, and make, in each case, only such allowances for surplusage as seem to be quite necessary, they are found to cover a gross area of 222,576 acres, or nearly 348 square miles.

A comparison will make clearer the significance of these figures.

London and its suburbs, described together in the census of 1851 as "the London District," has an area of 78,029 acres. In other words it was, in size, compared with the Manchester District, as two to seven nearly.

The population of the 348 miles of the Manchester District, in 1851, was 1,044,816 persons. That of the London District, at the same date, 2,362,236. Here the proportion is reversed. Though three and a half times as large, the provincial district has not half the population of the metropolitan. In few words, the London District is about eight times as densely peopled as the Manchester District.

Nevertheless, apart from the London District, there is no other in the United Kingdom, and, excepting also Paris and its suburbs, no other in Europe, on which a million of persons are so closely placed as they are in the Manchester District. And in one respect this group of population stands before every other of like magnitude in Europe, or perhaps in the world. *It has increased with greater rapidity during the last fifty years.* In 1801 the London District contained a population of 958,863—the Manchester District, as above described, one of 311,544 persons. In the fifty years 1801-51, for every one hundred persons at the beginning, 146 were added in the London District, and 236 in that of Manchester. On the other hand, it will be observed that the difference already established between the two districts is so great, that the lapse of even another half century, with the same rate of increase in each, would not much disturb their present relative proportions. The Manchester District would, in 1901, have only about three-fifths of the population of the London District; and the relative density would be only about one-fifth, instead of one-eighth.

The same difference runs through the entire history of the two districts. London was a considerable port and mart, and a royal residence, when much of the Manchester District was yet a free and pleasant hunting

ground for wolves. And the manner in which the population of this district has been brought together explains it.

THE GERMS OF THE MANUFACTURING POPULATION.

On a fine clear morning some 520 years ago—the sunlight being thrown to the north-west—the view from Blackstone Edge, over the site of this district, must have presented an almost unbroken expanse of wood and waste. Its human inhabitants were few, and even less visible by their works than the same number would be now. The enclosures were very few, and the half timbered, or wattled, houses of the time, were less easily distinguished at a distance than the stone or brick edifices of a later date; and when grouped together, their fires, fed almost exclusively with wood, cast into the air no cloud of lingering smoke, to mark the whereabouts of a town.* On the right of a spectator placed as we have supposed, stretched the broad surface of Brandwood Moor—russet or purple, as the season might determine—while beyond, deeply embayed in the straggling northern hills, lay the dense dark foliage of Rossendale forest. Ranging westward across a long line of wooded bluffs and bare sunlit slopes, and trending a little to the south, the eye may have caught, in the foreground of a tract of high-lying moorland, the half-timbered walls and long thatched roofs of the town of Bolton, the population of which had of late received a notable addition in a little band of men, uncouth of garb and strange in speech, and destined to sow seed that, after long delay, should have a mighty growth. Curiously dexterous in the art of weaving woollen cloths, they had come from Flanders, at the instance of Edward III, with the consent of their liege lord, the Duke of Hainault, the king's father-in-law, and under the guidance of an Englishman named John Kemp. (A.D. 1331.) Here they set up their looms, and wove, and taught weaving; and Bolton became, in due time, the centre of a supply of English woollen cloths such as had not been seen before.

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* Of the sixteen towns, records we may accept without much risk of being deceived, attest the existence, in some shape, at the period here referred to, of six. Manchester and Stockport were undoubtedly Roman stations, and were never afterwards abandoned by the people then collected around them. Bury was a Saxon town; and there is some evidence of its having also been a Roman station. Leigh, Rochdale, and Ashton-under-Lyne—the two former possessing ancient churches, and the last named claiming by other title an ancient existence—may also, if we accommodate our notion of a town to the circumstances of the time, be permitted to fall into the same category. Towns these, however, only such as might now be found in some parts of New Zealand or the Cape colony, and but small exceptions to the general aspect of the country.

But there was absolutely nothing in the aspect of the time to warrant augury of the gigantic ultimate growth of this Flemish seed. Nearly all the commercial energy and intelligence of Europe were still concentrated around a few centres, not one of which lay within a thousand miles of Bolton. The arts of book-keeping and banking, yet in their infancy, were unknown beyond the country of their birth, but these were used with a facility and success abundantly obvious in the history of the time. A Florentine banker farmed the customs revenue of England. Jews, the only capitalists in the country, still took interest on their loans in peril of personal mutilation and ruin, so could hardly look for less, on the best security, than thirty per cent. per annum. Commerce was growing, and learning was reviving, but more slowly in England than elsewhere. The Roman Church yet occupied the capital of Western civilization; and the crowning of Petrarch, and the tribunate of Rienzi, within the very same decennium—premonitory flashes of a new era in politics as in poetry—seemed to confirm to the old European centre of thought and action its ancient monopoly of wealth and power, even through a new day of knowledge and industry. It is to be observed, however, that the true sources of England's present greatness were then hidden, and could scarcely even have been guessed at. Maritime enterprise was limited, as in all past time it had been, to the narrow bounds of a continental coasting trade; and he was a daring man* who went so far to sea as to find the Madeira islands. Steam was undreamed of. The down of the cotton-pod was known, or used, only in the remote unvisited east. And though Newcastle coal did, about this time, make its first appearance in London, it had, as yet, no particular value to the Bolton weavers. Still must we deem the importation of these Flemish weavers a long stride in the path we have since trodden. England in 1330 grew wool for export, but wove no cloth the rich would wear, nor sent one yard of it abroad. And it needed something of the spirit that fought at Cressy to conceive and carry at Westminster the Acts of 1337, for summarily throwing all England, "after Michaelmas next," on the home trade for supplies of cloth: first by prohibiting the export of wool, and secondly by forbidding any person, of whatever rank, to wear cloth of foreign make—acts too sweeping to be obeyed, yet well serving to indicate the strength, the direction, and the

* One Machan, an Englishman, has credit for this feat, A.D. 1344.

extent of the project commenced with the Flemish immigration into Bolton, five or six years before.

SITES OF THE TOWNS.

All the considerable towns of this district are on the lines of its water shed. And these unite to pour the entire natural drainage of the district into the Mersey. Ascending this river, from Liverpool, we arrive on the borders of the Manchester District, as here described, about half way between Warrington and Manchester. Here the Irwell is received on the northern bank. Entering the Irwell we ascend in a north-easterly direction to Manchester. There, turning to the north-west, and passing, on the west bank, the junction of the Tonge, a little river flowing from Bolton, we ascend towards Radcliffe, passing, again, on the eastern bank, the junction of the Roch, and reach, successively, Radcliffe and Bury. Returning down the Irwell to its junction with the Roch, we pass eastward up that river, first to Heywood, and then to Rochdale. Again returning down the Roch and the Irwell to Manchester, we may ascend, thence, the Medlock, an affluent of the Irwell to Oldham. And passing down from Manchester to the junction of the Mersey and Irwell, we may, by ascending the former, pass, successively, through Stockport, (where the Mersey becomes the Tame,) Hyde, Ashton-under-Lyne, and Staleybridge. I have thus enumerated eleven out of the sixteen towns. The remaining five are the smallest of the group. Three of them—Atherton, Tyldesley, and Leigh, lie together in the extreme west of the district, and being inhabited chiefly by hand-loom weavers have shared the depression which has been gradually forcing that form of industry out of existence. Another, Eccles, is a mere suburb of Manchester; and until the factories of Patricroft, in its immediate neighbourhood, were established, was a suburb of residences for the rich rather than of industry for the poor. And the last, Middleton, a small factory town, formed around what was originally a rural village in a fertile vale, with a few hand-loom weavers, evidently owes its growth, such as it is, to the means of communication established for the use of the surrounding towns.

It will be observed that the use of water power must have rapidly given to several of these towns manufacturing advantages not possessed by Bolton. And amongst these Manchester soon took the lead, as being not only well endowed in this respect, but so placed in the valley of the

Mersey as to have the shortest and easiest communication with the port whence all drew their raw material, and to which the greater part of their exportable produce was sent.

The use of steam power has not disturbed the pre-eminence of Manchester. All these towns are by nature about equally well supplied with coal. And the canals first, and afterwards the railways, following most easily, as well as most profitably, the lines of most gradual ascent from the coast, have taken the general direction alike of the natural water shed and of the principal lines of road.

The district as above described, is bounded on the east by the scattered and devious, but tolerably central, line of hills running north and south through the greater part of England; and on the north by a straggling off-set from that line of hills running westward. In the nook formed by the junction of these two lines geology harmonises with commerce. There is here a depression great enough to permit the easy passage of a canal, joining the Mersey of Lancashire and Cheshire with the Calder of Yorkshire; and so achieving one of the most remarkable results of the canal-mania which distinguished the days of our grandfathers, somewhat as the railway-mania has marked our own.

All the ground in the district north of Manchester is more or less hilly. South of Manchester the land is low; and extensive mosses or peat bogs occupy a portion of the valley of the Mersey.

If a line be drawn through the centre of Manchester, due north and south, and crossed with another drawn due east and west, it will be observed that Rochdale is the most northernly town in the district, and that it is one of four lying in the north-east section of the figure so described; the other three being Heywood, Middleton, and Oldham. Two more, Ashton and Staleybridge, may be said to be due east of Manchester, both within five miles of it, and so near together that they may, for most purposes, be deemed one town.

Hyde and Stockport fall into the south-eastern section.

In the south-western section there is no town, the ground consisting of extensive and low-lying flats, on the banks of the Mersey and Irwell.

The north-western section is in some respects the most remarkable. It includes seven of the fifteen subsidiary towns. A line drawn from the

centre of Manchester, in a due north-west direction, would pass, very nearly, through the centre of Bolton, the largest of the seven, and, after Manchester, the largest town in the district. Excepting Rochdale (which owes a part of its growth to Yorkshire influences, as felt through the dip in Blackstone Edge), Bolton is also further from Manchester than any other considerable town in the district.

MATERIALS—WHENCE AND HOW OBTAINED.

I have said that the area of this district is about 222,500 acres; that its aggregate population in 1801 was 311,544 persons; and that in 1851 this number had risen to 1,044,816. These figures have been obtained by selecting from the census of 1851 the area and population of each of the townships and parishes comprised in the district, as above described, and where a part only of a township or parish could be taken as within the district, the area and population of the part excluded was carefully estimated with regard to all the data afforded, not only by that census, but also by each of the five preceding. The population of each of these separate areas, in 1851, was obtained, as to 56 places, not forming part of any town, directly from the census of 1801. As to 27 similar places, it could be obtained only by estimate; so many (1) falling partly out of the district, or (2) not having been separately dealt with for the census of 1801, or (3) evidently falling wholly or partly within one of the sixteen towns.

The area taken is in all cases that of the land not usually under water.

The area and population of each of the sixteen towns was obtained for 1801 and 1851, by a careful consideration of the materials afforded by the censuses, and of the local circumstances and character of each town.

Appended to this paper is a table, containing the principal results for each registration district, town and country. The whole of the detailed calculations and estimates involved in the production of this table were the work of my friend (and a fellow member of the Historic Society), Mr. T. A. Welton, of Fenchurch Street, London; and I have much pleasure in acknowledging that the Society is indebted rather to that gentleman than to myself, for the greater part of the figures on which the present paper is based.

DETAILS.

I have said that I find in the district, as described in the census of 1851, sixteen towns. These are :—

Names.	Area, 1851.	Population.		Increase per cent.	Density ⅌ acre in 1851.
	Acres.	1801.	1851.		
Manchester.....	9785	94409	404808	329	41.37
Oldham.....	2317	9024	46820	419	20.21
Stockport.....	2155	18880	53610	184	24.88
Bolton.....	1820	17429	60711	248	33.36
Ashton-under-Lyne	1525	4837	40723	742	26.70
Bury.....	1470	6852	27762	305	18.89
Stalybridge.....	1240	1500	23877	1492	19.25
Rochdale.....	1130	8500	29195	243	25.83
Heywood.....	750	2800	12194	335	16.26
Hyde.....	650	863	10050	1065	15.46
Middleton.....	400	1765	5740	225	14.35
Leigh.....	385	700	5206	644	13.52
Radcliffe.....	363	1847	5002	171	13.78
Eccles.....	325	2000	4108	105	12.64
Tyldesley.....	280	1809	3608	99	12.89
Atherton.....	250	2109	2780	32	11.12
Totals....	24845	175324	736195	320	29.63

Here the towns are arranged in the order indicated by the extent of the area occupied by each in 1851. It will be observed that this order coincides but roughly with that of the population at the same date, and scarcely in any degree with any other of the several variations exhibited.

Manchester, the largest town, whether measured by area or by population, and also the most densely peopled, is at the top of the list; and Atherton, the smallest, measured either way, and the least densely peopled, is at the bottom. But between these extremes, as may be seen at a glance, are wide variations of nearly every element brought to view.

The towns whose population has increased most rapidly during the fifty years in view are, very obviously, those in the valley of the Tame—Staleybridge, Hyde, and Ashton. But these are far from showing an uniform rate of increase. Staleybridge has increased 1,492 per cent., Hyde 1,065, and Ashton 742. And they have different densities:—19, 15, and 26 persons per acre. The significance of these differences is to be determined only by local investigation.

To make up the entire district, there are to be added 91 country town-

ships or parishes, or parts of these, which if added, in the aggregate, to the above table, make the whole area of the district 222,576 acres, its population in 1801—311,544; and in 1851—1,044,816. The increase in 50 years, in the whole district, having been 235 per cent.

The country districts, taken alone, have an area of 197,731 acres—or about eight times that of the towns. Their population was 136,220 in 1801; and 308,621 in 1851. In other words, at the beginning of the century, the town population of the district was to the whole as about five to nine. In 1851 the proportion was as rather more than seven to ten.

Taken by themselves, the country districts have increased their population in the last fifty years faster than the average of England, town and country together; but their rate of increase has been much behind that of the towns.

But this, it will be borne in mind, relates only to the entire fifty years, taken as a single period. If the rates of increase be examined for every ten years, it is found that, as a rule, all the towns were growing most rapidly between 1821 and 1831; and that in the country districts the period of most rapid growth was 1801 to 1811, and the period of slowest growth 1841 to 1851. The present paper has reference only to the aggregate period 1801-51; and its results may therefore in some cases not harmonise with those of observation confined to a part of that period.

The tables at the end of the paper exhibit the whole district divided into seven groups of towns and their surrounding country districts.

In the first group, the towns of Manchester and Eccles, with a population of 473,366 are surrounded by twenty-one country districts, with a population of 64,450, or less than one-seventh. The most densely peopled part of the surrounding country is about Openshaw, Droylsden, Newton, and Failsworth; and these also are the places of most rapid increase during the fifty years. The parts least densely peopled are about Urmstone, Stretford, Chorlton-cum-Hardy and Withington; at Moston; and at Barton-on-Irwell.

In the Bolton group, there are one town and eighteen country districts—the respective populations being 60,711 and 39,450. Here the proportion of country population is nearly two-fifths of the whole. In the Manchester group it is little more than one-eighth. There are, however, some parts of

the country about Bolton, as Kersley and Farnworth, more densely peopled than any similar district near Manchester. On the whole, the Bolton district is thickly inhabited; the only exceptions being at Over Hulton and Bradshaw, which do not include more than about one-tenth of the whole area.

In the group formed by Rochdale, Heywood, Bury and Radcliffe, and the sixteen country districts surrounding these, there is an aggregate town population of 74,153, against a country population of 83,821. Here there are one-ninth more persons in the country than in the towns. Some parts of the country, as Pilsworth and Ashworth, are but thinly peopled—having even lost instead of gained in that respect, since 1801. The rest of the country is well peopled.

In the Oldham and Middleton group, with two towns and twelve country districts, we have 52,560 persons in the towns and 54,552 in the country. The country about Royton is densely peopled; and about Tonge it is so much so as to suggest the existence of something very like a town. At Great Heaton there were fewer inhabitants in 1851 than in 1801; and the population is but thinly distributed over the townships of Alkington, Hopwood, and Thornham.

Stockport gives to its group a town population of 53,610 surrounded by ten country districts containing 14,135 persons. Here the country parts are, on an average, more thinly peopled than anywhere else in "the Manchester District." The inhabitants are fewest about Chadkirk and Brinnington, South Stockport, towards Bramhall, and about Offerton.

The Tame valley group, including Ashton, Staleybridge, and Hyde, and nine country districts, has in the three towns 74,651 persons, and in the country 40,148. This, as I have before observed, is the group of most rapid increase; the town population having increased tenfold, and the country population much more than doubled itself, in the fifty years in view.

The last group is one that might, perhaps, have been omitted, without impairing the completeness of "the Manchester District." Its towns are Leigh, Tyldesley and Atherton, having, in 1851, an aggregate population of 11,594. Around these are five country districts, containing a population

of 12,165. And as the latter are well, and nearly equally, inhabited, and the density of the town population is low, the general aspect of the group is much that of a densely peopled country district.

How the increase of population here shewn has been effected, is a question of some interest. Not by natural increase only, but also largely by immigration—by immigration from all parts of the United Kingdom, but chiefly from Ireland, and from the counties immediately adjoining. No attempt, space being deficient, can here be made to follow out this enquiry. But it may fitly form the subject of another paper.

The area before us is not of large extent, as compared with England and Wales. It is but as 222,000 acres to 35,000,000 (dry land), or as about 1 to 165. Yet its population is as 1 to 18.

The capital accumulated on the same ground probably now bears a much higher proportion to the number of persons using and enjoying it, than it did in 1801. And there is reason to believe, that if it has not all been actually saved on the spot, the amount imported from other localities has been more than balanced by that carried away.

The inducements under which men gather themselves together in this manner are various; but there can be no doubt that in the present age of the world the motive by far the most powerful is the industrial one; and that, as to the majority in number of the population so collected, it has been so in all ages of the world. It is a trite remark, that every successive step in civilization has been broadly marked by the additional power it has conferred upon men to live near each other. The hunter must needs have few near him; the herdsman cannot have many; and the farmer, with all modern improvements in agriculture, cannot on an average, raise the means of subsistence for more than one person to every five acres of cultivable land. In England and Wales there are nearly four acres of absolute area to each living person; but much of this is not, and never can be made cultivable. Yet all subsist; and many subsist in a style which necessitates the consumption of much capital and labour in forms not in any way conducive to the means of subsistence. We have in Great Britain, living in that degree of aggregation which is wholly inconsistent with agricultural industry, a proportion of our population, probably not less than four times as great as is similarly

placed on any like area in Europe, or in the world, though there are several extensive areas of similar character; and the explanation is nowhere more obvious than in the life of the Manchester district. We are doing the "town-population" work of more than half the world, in addition to our own. We are finding the capital and labour, and taking the profits of this town industry. And we are also wielding the power, social and political, and incurring the corresponding responsibilities of this position. Our towns, for any merely British purpose, are enormously in excess. Our country districts are, for the most necessary and imperative of British purposes, equally deficient. Our very being as a nation has come at length to hang upon the means of communication with those "country districts" abroad, in which the consumers of our exported produce live, and from the soil of which they raise the means of paying for what of ours they consume. Very well known is all this, but yet not always sufficiently remembered. And if in thus analysing, and casting into a new form, for a local purpose, a portion of the statistical material presented to us by the census of 1851, I shall have induced any additional attention to the phenomena now unfolding themselves in the growth of our town-population, I am quite sure that I shall have done good service.

TABLE I.

MANCHESTER DISTRICT.

TWENTY-ONE COUNTRY DISTRICTS AROUND THE TOWN OF MANCHESTER.

	Area.	Population.		Alteration.			Density ℔ sq. ml.		
	Acres.	1801.	1851.	Inc.	Dec.	℔ ct.	1801.	1851.	Altn.
Urmstone	974	532	730	198	—	37	350	480	130
Stretford (pt.)	2,790	1,177	*2,498	1,321	—	112	270	573	303
Chorlton-cum-Hardy	1,265	513	761	248	—	48	260	385	125
Withington	2,498	743	1,492	749	—	101	190	382	192
Levenshulme	605	628	1,902	1,274	—	203	664	2,012	1,348
Rusholme (pt.)	*356	300	1,200	900	—	300	539	2,157	1,618
Gorton	1,429	1,127	4,476	3,349	—	297	505	2,005	1,500
Openshaw (pt.)	*321	189	1,259	1,070	—	566	377	2,510	2,133
Droylsden	1,611	1,552	6,280	4,728	—	305	617	2,495	1,878
Newton (pt.)	*735	*495	3,001	2,506	—	506	431	2,613	2,182
Failsworth	1,064	2,622	4,433	1,811	—	69	1,577	2,666	1,089
Moston	1,271	618	904	286	—	46	311	455	144
Blackley	1,764	2,361	3,503	1,142	—	48	857	1,271	414
Crumpsall (pt)	*508	*300	*750	450	—	150	378	945	567
Prestwich	1,906	1,811	4,096	2,285	—	126	608	1,375	767
Broughton (pt.)	*360	*250	*1,000	750	—	300	444	1,778	1,334
Pendleton	*1,000	*900	*3,000	2,100	—	233	576	1,920	1,344
Pendlebury	930	437	2,750	2,313	—	528	301	1,892	1,591
Clifton	820	812	1,647	835	—	103	634	1,285	651
Worsley	6,240	5,062	10,189	5,127	—	101	519	1,045	526
Barton-on-Irwell (pt.)	*10,205	*4,197	*8,579	4,382	—	104	263	538	275
	38,648	26,626	64,450	37,824			Density ℔ Acre.		
Town of Manchester	9,785	94,409	404,808	310,399	—	329	9.68	41.37	31.72
	48,433	121,035	469,258	348,223					
Town of Eccles	325	2,000	4,108	2,108	—	105	6.16	12.64	6.48
	48,758	123,035	473,366	350,331					

* Estimated.

TABLE II.

EIGHTEEN COUNTRY DISTRICTS SURROUNDING BOLTON.

	Area.	Population.		Alteration.			Density ℔ sq. ml.		
	Acres.	1801.	1851.	Inc.	Dec.	℔ ct.	1801.	1851.	Altn.
Over Hulton	1,300	619	452	—	167	—27	305	222	—83
Little Hulton	1,470	1,498	3,184	1,686	—	113	652	1,386	734
Middle Hulton	1,280	819	888	69	—	8	410	444	34
Kersley	900	1,082	4,236	3,154	—	291	769	3,012	2,243
Farnworth	1,450	1,439	6,389	4,950	—	344	635	2,820	2,185
Great Lever	770	398	713	316	—	79	331	593	262
Rumworth	1,300	700	1,386	686	—	98	345	682	337
Halliwell	2,320	1,385	3,959	2,574	—	186	382	1,092	710
Little Bolton (pt.)	*600	*187	580	393	—	210	199	619	420
Sharples	3,920	873	3,904	3,031	—	347	143	637	494
Bradshaw	1,380	380	853	473	—	124	176	396	220
Harwood	1,100	1,281	2,057	776	—	61	745	1,197	452
Ainsworth	1,216	1,240	1,781	541	—	44	612	880	268
Breightmet	970	734	1,540	806	—	110	484	1,016	532
Tonge } Haulgh (pt.)	*880	*958	*1,926	968	—	101	697	1,401	704
Darcy Lever	540	589	2,091	1,502	—	255	698	2,478	1,780
Little Lever (chap.)	1,020	1,276	3,511	2,235	—	175	801	2,203	1,402
	22,496	15,458	39,450	24,159			Density ℔ Acre.		
Town of Bolton	1,820	17,429	60,711	43,282	—	248	9.58	33.36	23.78
	24,316	32,887	100,161	67,441					

* Estimated.

TABLE III.

SIXTEEN COUNTRY DISTRICTS SURROUNDING ROCHDALE, HEYWOOD, BURY, AND RADCLIFFE.

	Area.	Population.		Alteration.			Density ℔ sq. ml.		
	Acres.	1801.	1851.	Inc.	Dec.	℔ ct.	1801.	1851.	Altn.
Castleton (pt.) ..... Butterworth ..... Spotland (pt.) ..... Wardleworth ..... Wuerdle with Wardle.... Blatchinworth with Calderbrook	34,210	18,077	43,320	25,243	—	140	338	810	472
Heap (pt.)	*2,184	*1,483	3,854	2,371	—	160	435	1,129	694
Pilsworth	1,478	418	373	—	45	—11	181	162	—19
Lower Tottington	5,038	4,314	10,691	6,377	—	148	548	1,358	810
Elton (pt.)	*2,171	*1,800	*3,500	1,700	—	94	531	1,032	501
Pilkington	5,378	5 786	12,863	7,077	—	122	689	1,531	842
Radcliffe (pt.) (P).....	*2,103	*650	1,291	641	—	99	198	393	195
Bury	*1,250	*500	1,000	500	—	100	256	512	256
Walmerston-cum-Shuttle-worth	5,056	2,166	4,802	2,636	—	122	274	608	334
Ashworth	1,022	295	277	—	18	—6	185	173	—12
Birtle-cum-Bamford	1,388	753	1,850	1,097	—	146	347	853	506
Country.....	61,278	36,242	83,821	47,642			Density ℔ Acre.		
TOWNS.									
Rochdale.....	1,130	8,500	29,195	20,695	—	243	7.52	25.83	18.31
Heywood.....	750	2,800	12,194	9,394	—	335	3.73	16.26	12 53
Bury.....	1,470	6,852	27,762	20,910	—	305	4.66	18.89	14.23
Radcliffe	363	1,847	5,002	3,155	—	171	5.09	13.78	8.69
Towns	3,713	19,999	74,153	54,154					
Total	64,991	56,241	157,974	101,796					

* Estimated.

TABLE IV.

TWELVE COUNTRY DISTRICTS SURROUNDING OLDHAM AND MIDDLETON.

	Area.	Population.		Alteration.			Density ℔ sq. ml		
	Acres.	1801.	1851.	Inc.	Dec.	℔ ct.	1801.	1851.	Alta.
Crompton	2,864	3,482	6,375	2,893	—	83	778	1,425	647
Royton	1,352	2,719	6,974	4,255	—	156	1,287	3,301	2,014
Oldham (pt.)	*2,300	*3,000	*6,000	*3,000	—	100	835	1,670	835
Saddleworth	18,280	13,665	17,799	7,134	—	67	373	623	250
Alkrington.....	788	319	373	54	—	17	259	303	44
*Great Heaton	866	267	150	—	117	—44	197	111	—86
Little Heaton	509	494	800	306	—	62	621	1,006	385
Middleton (pt.)	*1,508	1,500	2,977	1,477	—	98	637	1,263	626
Tonge	367	711	3,831	3,120	—	439	1,240	6,681	5,441
Hopwood	2,043	948	1,575	627	—	66	297	493	196
Thornham	1,998	674	1,510	836	—	124	216	484	268
Chadderton	2,978	3,452	6,188	2,736	—	79	743	1,330	588
Country	35,853	28,231	54,552	26,438			Density ℔ Acre.		
TOWNS.									
Oldham	2,317	9,024	46,820	37,796	—	419	3.89	20.21	16.32
Middleton	400	1,765	5,740	3,975	—	225	4.41	14.35	9.94
Towns	2,717	10,789	52,560	41,771					
Total	38,570	29,020	107,112	94,609					

* Estimated.

TABLE V.

TEN COUNTRY DISTRICTS SURROUNDING STOCKPORT.

	Area.	Population.		Alteration.			Density ℔ sq. ml.		
	Acres.	1801.	1851.	Inc.	Dec.	℔ ct.	1801.	1851.	Altn.
Burnage	658	383	563	180	—	47	373	548	175
Didsbury	1,527	619	1,449	830	—	134	259	607	348
Heaton Norris (pt.)	*1,583	*1,068	2,037	969	—	91	432	824	392
Reddish	1,541	456	1,218	762	—	167	189	506	317
Werneth	1,560	1,152	3,635	2,483	—	216	473	1,491	1,018
Romiley (or Chadkirk)	2,290	825	1,364	539	—	65	231	381	150
Bredbury	2,521	1,358	2,991	1,633	—	120	345	759	414
Brinnington (pt.)	*683	*140	301	61	—	40	131	188	57
Stockport (pt.)	*500	*150	*225	75	—	50	192	288	96
Offerton	730	351	352	1	—	0	308	309	1
	13,593	6,502	14,135	7,533			Density ℔ Acre.		
Town of Stockport	2,155	18,880	53,613	34,730	—	184	8.76	24.88	16.12
Total	15,748	25,382	67,745	42,263					

* Estimated.

TABLE VI.

NINE COUNTRY DISTRICTS SURROUNDING ASHTON-UNDER-LYNE, STALEYBRIDGE, AND HYDE.

	Area.	Population.		Alteration.			Density ℔ sq. ml.		
	Acres.	1801.	1851.	Inc.	Dec.	℔ ct.	1801.	1851.	Altn.
Ashton-under-Lyne (part of Parish)	*7,675	*10,832	20,356	9,524	—	88	903	1,697	794
Staley (T.)	*2,520	*955	*1,800	845	—	88	243	457	214
Dukinfield	*790	*300	1,200	900	—	300	243	972	729
Matley	700	285	252	—	33	(—12)	261	230	—31
Newton	868	1,005	7,481	6,476	—	644	741	5,516	4,775
Godley	639	270	1,353	1,083	—	401	270	1,355	1,085
Hyde (pt.)	*239	*200	1,518	1,318	—	659	536	4,065	3,529
Denton	1,647	1,362	3,146	1,784	—	131	529	1,222	693
Haughton	1,130	1,139	3,042	1,903	—	167	645	1,723	1,078
Country	16,208	16,348	40,148	23,833			Density ℔ Acre.		
The Towns of Ashton-under-Lyne	1,525	4,837	40,723	35,886	—	742	3.17	26.70	23.53
Staleybridge	1,240	1,500	23,877	22,377	—	1,492	1.21	19.25	18.04
Hyde	650	863	10,051	9,188	—	1,065	1.33	15.46	14.13
Towns	3,415	7,200	74,651	67,451					
Total	19,613	23,538	114,799	91,284					

* Estimated.

TABLE VII.

FIVE COUNTRY DISTRICTS SURROUNDING LEIGH, TYLDESLEY, AND ATHERTON.

	Area.	Population.		Alteration.			Density per sq. mi.		
	Acres.	1801.	1851.	Inc.	Dec.	per ct.	1801.	1851.	Aug.
Bedford (pt.), Pennington, West Leigh	*5,384	*4,473	*8,501	4,028	—	90	532	1,011	479
Tyldesley-cum-Shackerley (pt.)	*2,194	1,200	1,789	589	—	49	350	522	172
Atherton (pt.)	*2,073	1,140	1,875	735	—	64	352	579	227
Country	9,651	6,813	12,165	5,352			Density per Acre.		
Towns of									
Leigh	385	700	5,206	4,506	—	644	1.82	13.52	11.70
Tyldesley	280	1,809	3,608	1,799	—	99	6.46	12.89	6.43
Atherton	250	2,109	2,780	671	—	32	8.44	11.12	2.68
Towns	915	4,718	11,594	6,976					
Total	10,566	11,531	23,759	12,328					

* Estimated.

THE ENGLISH POOR-LAW SYSTEM, VIEWED IN RELATION TO EDUCATION AND MORALS, IN ENGLAND AND WALES.

By the Rev. Thomas Moore, M.A.,

CHAPLAIN OF THE WEST DERBY UNION.

(READ DECEMBER 18TH, 1856.)

The subject of the following sketch is the bearing of the English Poor-Law on the Education and Morals of the people. Its importance will appear from a variety of considerations, of which it may be sufficient to mention, the number of the pauper class, the expense of their maintenance, and the great influence for good or evil, which they may exercise on the community at large.

Number.—To shew the number, we have but to refer to the Official Returns, and we find that there were in receipt of relief—

	In-door.	Out-door.	Total.
July 1st, 1853 ..	96,420 ..	670,660 ..	767,080
Jan. 1st, 1854 ..	110,739 ..	695,387 ..	806,126

Of the above, there were under the age of 16 years—

	In-door.	Out-door.	Total.
July 1st, 1853 ..	35,911 ..	235,749 ..	271,660
Jan. 1st, 1854 ..	45,431 ..	258,747 ..	304,178

In may not be unimportant to remark, that in 1853 the in-door pauper children were nearly 37 per cent. of the in-door paupers, and the out-door pauper children above 30 per cent. of the whole out-door relief list. On the 1st of January, 1854, the in-door children were 41 per cent. and the out-door 37 per cent. of their respective totals. The children are composed in the main of two great classes—the orphans and the illegitimate. In the years 1853, 1854, they formed when taken together, 78 per cent. of the whole, as out of 35,911 in the former of those years, there were nearly 22,000 orphans and upwards of 6000 illegitimate; and in the latter

year, out of 45,431, there were upwards of 23,000 orphans and nearly 12,000 illegitimate.

Expense.—Having thus stated the numbers relieved, we next proceed to the expense of their maintenance. There was levied for poor-rates—

In 1852 .. £6,552,298
In 1853 .. £6,522,412

The expenditure in each of these years was somewhat greater.

It is instructive to compare these rates with those of 1834, the year immediately preceding the passing of the Poor-Law Amendment Act. In that year the rates were £8,338,079; and allowing for the increase of population since then, the levy for poor-rate would at the same proportion have been in 1853, £10,720,387, but it was actually only £6,522,412, or a decrease of nearly 40 per cent. This result is satisfactory, as it proves that a great saving has been effected by the introduction and working of the New Poor-Law system.

Influence of the Pauper Class.—The influence which such a large class as the pauper one exercises on the community, must be sensibly felt; and those best acquainted with the subject have stated that under the old system, crime recruited its ranks largely from the inmates; and it is only too much to be feared that modern workhouses are not altogether free from the same defect. That a great change for the better has taken place in the condition of the pauper class, by the new system, is evident to anyone who glances at the reports of the state of the poor before, or for a few years after the passing of the Act, and who contrasts their present condition with such description. As the present paper does not propose to treat the subject fully and in detail, the writer intends to confine himself to one branch of it, viz., the means employed for training the young to be useful citizens.

Adults and Children differently regarded.—The feelings with which the adult pauper and the pauper-child are regarded are very different, and rightly so. The condition of the former is regarded with suspicion; and though poverty is not a crime in itself, yet it so often arises from crime, and from controllable causes, that the pauper is looked upon as guilty of criminality to some extent; and hence severe tests are often applied to ascertain the reality of the destitution. But the orphan, the child of

destitute parents, and the illegitimate, ought to be, and are generally regarded in a different light; and self-interest, as well as reason and right feeling, point the way to a very different mode of treatment. It is not meant that all adult paupers are to be regarded in a suspicious light. It is generally the able-bodied who are so, but the old and infirm always meet with sympathy and attention.

Poor-Law; its object.—The object of the poor-law is, while it aims at relieving cases of real distress, to diminish as much as possible the pauperism of the country. This it attempts to do by detecting unworthy applicants for parochial relief, while at the same time it endeavours to de-pauperise those who have sunk into that pitiable condition from whatever cause. In England this is no easy task to accomplish, as it is at once the richest and the poorest country in the world; and while some of its people arrive at the extreme of wealth and luxury, there are others who feel an extent of hardship and distress unknown in any other country.

Workhouse Test.—To diminish pauperism by detecting unworthy applicants, is a use which is made of the workhouse. If persons can readily get parish relief, and remain at their own homes and have their freedom, they will apply for it. In such cases, the offer of the workhouse often removes the application, as in general nothing further is heard of the case. If relieving officers, whose duties are most onerous and responsible, are not careful and conscientious, cases of hardship may occur in really deserving cases, where a little temporary relief would remove the distress, whereas the offer of the house would, if accepted, make paupers of those who never desired to be so.

Pauper Children.—The children may be divided into two classes—the in-door and out-door relief list. From what has been already stated, it will be seen that there is a great disparity between them, the numbers being in 1854, 45,431 and 258,747 respectively. From this it is seen that about 15 per cent. only of the pauper children are maintained in the workhouse.

Education.—For the educational purposes connected with workhouses, England and Wales are divided into five districts, viz., the Metropolitan, the Southern, the Eastern and Midland, the Northern and the Western including Wales, and over each of these there is a Government Educational Inspector. In the case of children, the problem to be solved, is to

give them such training as will fit them for the active duties of life, and make them useful citizens—in a word, to raise them permanently from the pauper class. Anything which falls short of this is comparatively thrown away; as those who have not been fitted for honest occupations, will soon find those who will indoctrinate them in pursuits congenial to man's evil and degrading propensities, and make them the pest of society.

Schools.—For the training of the children, there are schools attached to most workhouses, and the necessary officers to take charge of them. The law provides that every child shall have three hours' instruction daily, and the remainder is supposed to be given up to industrial occupations of various kinds. Wherever land is attached to workhouses and is cultivated by the boys, it is found beneficial in its influence on health and character.

Industrial Schools.—Another plan has been much approved of, and has been adopted in the Metropolitan and Northern districts chiefly, and with marked advantages. I refer to District, or as they are sometimes called, Industrial Schools. In these the children are entirely removed from the adults, and the whole establishment is devoted to the training of the young. District Schools are usually intended for the education of the children of several parochial unions, but sometimes a single parish has one of its own. Of the latter Liverpool is an example; and of the former Swinton, which is intended for Manchester, Bury, Rochdale, Barton and Prestwich.

Teachers.—The Committee of Council on Education have devoted particular attention to the improvement of workhouse teachers, and pays their salaries according to their merits. Boards of Guardians are thus induced to have properly qualified teachers; whereas, had the various Unions to pay the teachers, it is quite clear that the education in most cases would be greatly neglected.

School Books.—Workhouse schools have a great advantage in being able to obtain grants of books at a cost much more moderate than is practicable for National Schools, and hence there is every inducement to have the schools well supplied with the best class of school books.

Chaplain.—It it further provided that the schools be catechised monthly by the Chaplain; and in those Unions which have a Chaplain who undertakes no other clerical duty, it is expected that the Schools should have his special attention.

Results.—The machinery at work for the improvement of the pauper children, as thus slightly sketched, seems capable of producing the very best results, and without doubt it has been productive of great benefits. But to any one at all familiar with the subject practically, or who has paid any attention to the Poor Law Reports, it will be evident that the results are by no means commensurate with the machinery employed.

I shall now endeavour to put before you the reasons why schools in workhouses have not been so successful as might have been expected.

Want of Success.—1. *In the first place, the system has not been adequately carried out.* It has been stated above that there were only 15 per cent. of pauper children brought up in the workhouses. The mass of pauperism is thus untouched; and were even the greatest success to be obtained with those who are maintained in the workhouses, but a small portion of the proposed object would be accomplished. The expense of in-door relief of all the poor, adults and children, was for the year ending March 25, 1853, £762,718, while the out-door relief was £2,775,556. The great disproportion in the amount of the out-door relief is caused by the want of workhouse accommodation. It is impossible therefore to offer the workhouse to the bulk of the applicants, in order to distinguish real from pretended distress, and much expense is often incurred through this inability. It is to be feared that the majority of the out-door children are greatly neglected. In some cases, the Guardians endeavour to make the sending of their children to school, the condition of granting the relief. If this rule were invariably acted upon, much advantage would result; but from the character of those who in general are thrown upon the parish, it is not to be expected that the education and correct training of their children would be a primary or even a prominent object; and it is far more likely that the condition, where it is attempted to be imposed, is evaded rather than conscientiously carried out. Even when accommodation is provided for the education of children, it is not always taken advantage of. A striking instance of this is the following:—Swinton is a large Industrial School, built for the use of several Unions, already mentioned, and yet in 1852 (and the numbers in the later returns have diminished, except in the cases of Barton and Manchester),

Bury sent	only	71	out of	88,797	population
Rochdale	„	37	„	72,522	„
Barton	„	81	„	31,584	„
Prestwich	„	14	„	41,448	„

Of these Barton, which happens to be the nearest to Swinton, educates 1 in 1000, whereas Prestwich sends scarcely more than 1 in 3000. If Rochdale equalled Manchester in population, it would educate at its present rate only 95, whereas Manchester had at Swinton 637, exclusive of those educated in the Manchester workhouse. Manchester, when compared with these other Unions, does its duty well, and yet altogether it educates considerably less than 1 in 200 of the population.* It is surprising, however, that men so enlightened should permit the children who are retained in the workhouse, to be under the management of their fellow paupers, when competent teachers could be obtained, with the help of government, at so slight an expense. The Select Vestry of Liverpool educate somewhat more than 1 in 200, and stand at the head of pauper education, at least in the Northern District. It is laid down by competent authority, that every Board of Guardians in the country should educate *one per cent.* of the population to produce a sensible effect on pauperism and crime. If this be a fair proportion to take, it is evident, from the instances adduced, that even in the most favorable cases which can be selected, scarcely more than one-half are under proper training. The difference between Manchester and Rochdale which is so striking, and that, too, in populations so nearly alike in character, is accounted for by the fact that at Rochdale there is very little workhouse accommodation, and hence the number receiving in-door relief is small.

2. *In the second place, it will be well to enquire how far education in workhouses secures the desired end.* Workhouses are intended for several classes of inmates, and ought to be so constructed as to admit of a good classification in order to keep the vicious from the virtuous. But the houses, in which anything like a sufficient classification exists, are few indeed. We may divide inmates into three general classes:—(1) Those not able-bodied, i.e. old and infirm. (2) The able-bodied. (3) The children. It is in the able-bodied class of men and women that the greatest necessity

* These facts are derived from the Reports of T. B. Browne, Esq., her Majesty's Inspector of Workhouse Schools for the Northern District.

arises for a proper classification, and where the greatest difficulty is found in obtaining it. In the able-bodied class you have the boy of 16 and the various stages of manhood; and similarly with the females. The generality of this class is decidedly vicious and depraved in its habits. Their evil influence in a workhouse is felt in many ways, of which the following are examples. When, as sometimes happens, boys or girls have not been provided with situations before the age at which school education terminates, they are removed into the able-bodied class. They there meet with such contamination that in many cases the ruin of such persons can be distinctly traced to such intimacies. If, again, boys or girls who have been put in situations, become temporarily unable from sickness to remain at their employments, they return to the workhouse, and when recovered, they are exposed to the most imminent danger, if there is any delay in providing them with fresh situations. The society into which they are thrown consists of those who are familiar with crime, and to whom a prison is a sort of second home. On the female side is to be found the fallen woman, and those who come to give birth to illegitimate children.

In well regulated workhouses, the children are separated from the adults. But even when the principle of classification is carried out most strictly, the evil is not fully met or remedied. As long as they are in the same building, stone walls, or the utmost vigilance on the part of officers, will not keep them separate. But more prejudicial than all is, I consider, the low state of moral feeling in a workhouse. The thoroughly pauper element is too strong, and influences everything. The daily communication between parents and children, which the law provides for, leads frequently to much mischief, for the truth cannot be disguised, that the less such parents see their children, the better. Masters of workhouses complain much of irregularities in discipline to which it gives rise, and the teachers have ascribed the origin of much evil in the children, to this cause. Pauper children are more affected by the sayings and doings of their own class than by the influence of a superior one. The vicious deeds and habits of the inmates become known and are talked of by the boys and girls; familiarity with crime is the result, and a disposition to remain contentedly in a pauper condition. Boys and girls put out to situations often make excuses to return to what they consider their home, or take advantage of the first difficulty, and leave their places. Workhouse children are more

liable, perhaps, than others to be found fault with by their mistresses, as they are less accustomed to household matters, and they will not bear rebuke, and hence return to the place where they have been brought up. Besides, it sometimes happens that intimacies made in the workhouse with the regular inmates are so strong in their influence, that excuses are eagerly sought for to return again. Hence it is seen that a feeling of independence has not been produced, but that rather the pauper feeling is made deep and lasting. If the tone of feeling be low in a school, and decidedly in favour of pauperism, however energetic the teachers and other officers may prove themselves, and however well qualified for their posts, their efforts will be to a considerable extent inappreciable. The important influence of the general tone of feeling in a school, is seen in the remarkable example of the Rugby School under Dr. Arnold; and what was true in that case, will, I think, be found to prove universally true.

3. *A third difficulty is the position of the Schoolmaster in Union Schools.* —His position is peculiar. He is not merely a teacher, as is the case with National Schoolmasters, but he finds he has other laborious and often irksome duties to discharge. The children are constantly under his care, and from six a.m. to eight p.m. he has scarcely a moment he can call his own. He has to see to the cleanliness of the children and of the schoolroom, take charge of their clothing, give it out weekly and see that it is returned. Self-improvement is nearly out of the question. But it is not merely the laborious nature of his duties which makes his situation disagreeable, but also his position with regard to the Master of the workhouse. This latter circumstance does not necessarily produce unpleasantnesss, but it has done so, in so many cases, that it cannot be omitted from the number of the Teacher's difficulties. The Master is responsible for the good management of the entire house. To the Schoolmaster is confided the childrens' department; and unhappily the never-ending complaint is, that these two officers are on bad terms. Though it cannot be supposed that the Teacher is without fault, yet such differences have been almost invariably ascribed to improper and uncourteous interference on the part of the Master; and such conduct is accounted for by the fact that Masters' situations are in general not such as to secure men of good standing or proper qualification. There is no officer who can exercise so great an influence on the well-being of the house as the Master. His salary should

be good, and men of mark should be selected for the office. Were this the case we would hear of fewer complaints. This evil is remarkably illustrated by the case of Kneller Hall. By a Minute dated 21st December, 1846, a scheme was embodied for "Normal Schools for Training [School] Masters for Workhouse and Penal Schools," and as a part of this, Kneller Hall was established. But after the experiment of a few years, it has been closed. The chief difficulty was to meet the peculiar requirements of workhouse teachers, of whose duties teaching forms but a part. The Kneller Hall men were sent out prepared in the best manner, and were naturally proud of their acquirements, but they had no preparation for that portion of a workhouse teacher's duty which is peculiar to him, and hence discontent was the natural and necessary consequence, and the establishment had to be given up.

4. *Incompetent Teachers.*—Another difficulty is when the salary is small, and only incompetent persons are induced to become candidates. From these and other causes the fluctuation of Teachers is very great, and the consequences are always most injurious. It is only when the Master and Teachers act in harmony, and when the Teachers remain for any length of time, that Schools can make healthy progress; and it is precisely in such cases, and in no other, that the Government Inspector gives a favorable report.

5. *Discouragement of Teachers.*—Workhouse Teachers have fewer encouragements than any other. As a rule, the Guardians are so occupied with relief and the general business of the Union, that they take little practical interest in the Schools. The Teacher's work is little noticed, and it is possible that however zealous and conscientious he may be, the minds of the Guardians may receive a wrong bias towards him. He is not, however, without encouragement; but his chief support is a strong sense of duty, and the earnest persuasion of the importance of the position which he holds, as affecting the temporal and eternal interests and well-being of those who are committed to his trust.

6. *Another element of the want of success* is the small number of inmates in a majority of the workhouses—for it is almost as expensive to get a proper staff of officers for a small workhouse as for a large one. The condition of the small Unions is very backward, and there is scarcely an instance of a good report in such cases. Out of the 140 workhouses in

the Northern District, there are 93 where the number of boys is under 20; 23 where it is under 30; and only 21 where there are 40 boys and upwards. There are four with 100, viz., Newcastle-upon-Tyne, Liverpool, Preston and West Derby. The proportion is much the same in the other districts as in the Northern.

7. *Providing situations for the children.*—If boys and girls have not the prospect of obtaining situations when they are ready for them, the influence on the Schools is injuriously felt. They lose hope, and have nothing to stimulate them to exertion. Were this matter attended to systematically, it would tend strongly to promote exertion and a feeling of independence. In cases where Schools obtain a good character, and where there is a steady demand for boys and girls, a healthy state and tone are generally found to exist.

8. *Industrial Training defective.*—In towns this can hardly be carried out in an efficient manner, as only in-door occupations can be pursued; and in country places, where land may be had in abundance, it is generally neglected. Wherever the cultivation of land is a portion of the industrial training, a good effect is almost invariably produced.

9. *Inferior physical condition of the children.*—As you descend in the social scale man's physical and mental energies seem to degrade, and hence this inseparable concomitant of pauperism is to be added to all the other difficulties in the way of reclaiming the pauper child.

Having said so much of the difficulties and imperfections in the way of Pauper Education, it remains to say a few words as to the method by which it might be improved. I have not left myself sufficient space to enter fully into this question; and, indeed, for its full and proper discussion it would require a separate paper. From what has been already said, the nature of the remarks which I am about to make will be readily anticipated.

Suggestions.—The evil influence which workhouses are calculated to have upon the bringing up of youth has been set forth, not indeed with all the power of which the subject is capable, but still, perhaps, after a manner sufficient to shew the great necessity which exists for a complete separation of the children from the adults. The net-work of pauperism, in whose meshes children are entangled, and from which they find it next to impossible to

extricate themselves, would to a great extent be broken through; and the complete separation of children from adults could be effected at a much less expense of feeling than is generally imagined. If we remember that the orphans and illegitimate children constitute 77 per cent. of the whole, we shall see that the great bulk has no one particularly interested in looking after them. I am persuaded also that the separation of the dissolute pauper parents and their children should be *insisted on*, if the children are to be reclaimed. It is repugnant to our natural feelings to propose such separation, but experience goes to shew that unless it be adopted the work will never be effectually accomplished.

The complete separation, and the formation of District Schools would obviate most of the difficulties noticed here. The tone of the School would not then be taken from the contaminating influence of adult paupers; the position and pay of the Schoolmaster would be better, and a superior class of men would present themselves. The head of the establishment should be a man of educated and enlarged mind. The industrial training could also be fully carried out.

Suggestions illustrated.—As practical illustrations of what is here advanced, I may refer to the Kirkdale Industrial Schools and to those at Swinton. These have been productive of great good, and have raised hundreds from the pauper class to be useful and industrious members of the community. The population of a great number of Unions is so large, that they would each require such a School for the training of the whole of the pauper children. If the smaller Unions were to unite throughout the Kingdom, and to form District Schools, and if they were put under good management, the best results might be looked for. Good management is, however, as important as the formation of districts, for we have an example in Leeds of how little an Industrial School may accomplish, through bad management.

In the management of District Schools valuable hints might be derived from the family system, as practised at Mettray, for the reformation of juvenile offenders.

It would not be difficult to point out other examples, both at home and abroad, in confirmation of *the principle of separation*, the necessity of which is strongly shewn by the various facts and statements adduced in this paper. It is beginning to be more extensively acted upon, but until

it be more generally adopted and until the majority of pauper children are brought under the influence of sound education and judicious training, the results most desired will not be produced. Gradual improvement is all but certain, for the cause of education will not in the present day be lost sight of; and the prominence which it has attained is no more than its importance demands. But though educational subjects have been much discussed, and the instruction in schools much improved in consequence, we are yet far from that degree of excellence at which it is quite possible to arrive. It is earnestly to be hoped that England will not rest satisfied till she secures the first place among the nations in the training of her labouring population, and in the enlightened treatment of her poor.

Workhouses may be improved.—Even without resorting to District Schools, the condition of workhouses might be materially improved. This could be accomplished by raising the standard of workhouse Masters to be the same as that in prisons. If an educated and thoroughly competent person filled this important office in every case, much might be done to de-pauperise both adults and children. Attention to classification is also of great importance.

But, after all, I am persuaded that nothing would tend so effectually to do so, as THE COMPLETE SEPARATION OF THE CHILDREN FROM THE ADULTS; AND DISTRICT OR INDUSTRIAL SCHOOLS UNDER A GOOD SYSTEM OF MANAGEMENT.

ON A FUNGOID DISEASE AFFECTING THE PEAR TREE.

By Thomas Sansom, A.L.S., F.B.S.E., &c.

(READ 20TH DECEMBER, 1855.)

The Historic Society of Lancashire and Cheshire having lately extended its field of operations, and included under the general term "Science" all subjects connected with Botany and Natural History, I offer no apology for bringing before the members the subject of the present notice. I am induced to do so as I consider, first, that all questions relating to Natural History are acceptable; and, secondly, that when those subjects have any bearing upon the cultivation or domestic use of the vegetable kingdom, their value is greatly enhanced. In the present instance, I fear I shall not be able to throw much light on the peculiar formation I have brought under notice, but I lay before the Society the little I have been able to acquire, in the hope that it may lead to further observations, by botanists better able to investigate the subject than I am.

In the garden of Mr. Edward Higgin, at Walton Breck, near Liverpool, are several pear trees. Three of these trees have suffered from a disease, to such an extent as to render the fruit unfit for food. As the disease did not make its appearance to any extent until after the fruit was gathered, Mr. Higgin supposed his gardener had bruised the fruit in collecting it; but upon further investigation, he found such was not the case, as all the pears had been picked by hand and housed with great care. When the fruit was first gathered it appeared perfectly sound, and it was not until several days after it had been deposited in the store-room, that a change took place. It soon became apparent, however, that a large portion of the fruit of three of these trees was rapidly decaying, whilst the fruit of the other trees remained perfectly sound. Upon a more careful examination of the pears, Mr. Higgin discovered, in every one, a nucleus from which the disease appeared to spread, thus confirming him in the opinion that the decay arose from some peculiar disease, and was not accidental.

Mr. Higgin, in forwarding specimens to me for microscopical examination, states that Tree No. 1, a *Maria Louise*, is a well-grown tree four or five years old, growing against the end of his stable, on a brick wall facing nearly south. It was barren until last year, when it produced a large crop, which was gathered in October, the fruit remaining in perfection until Christmas. This year it had only thirty-nine pears, which duly ripened and were gathered in October, immediately after which, part became infected. He is not aware that any showed signs of the disease until a day or two after being placed in the store-room.

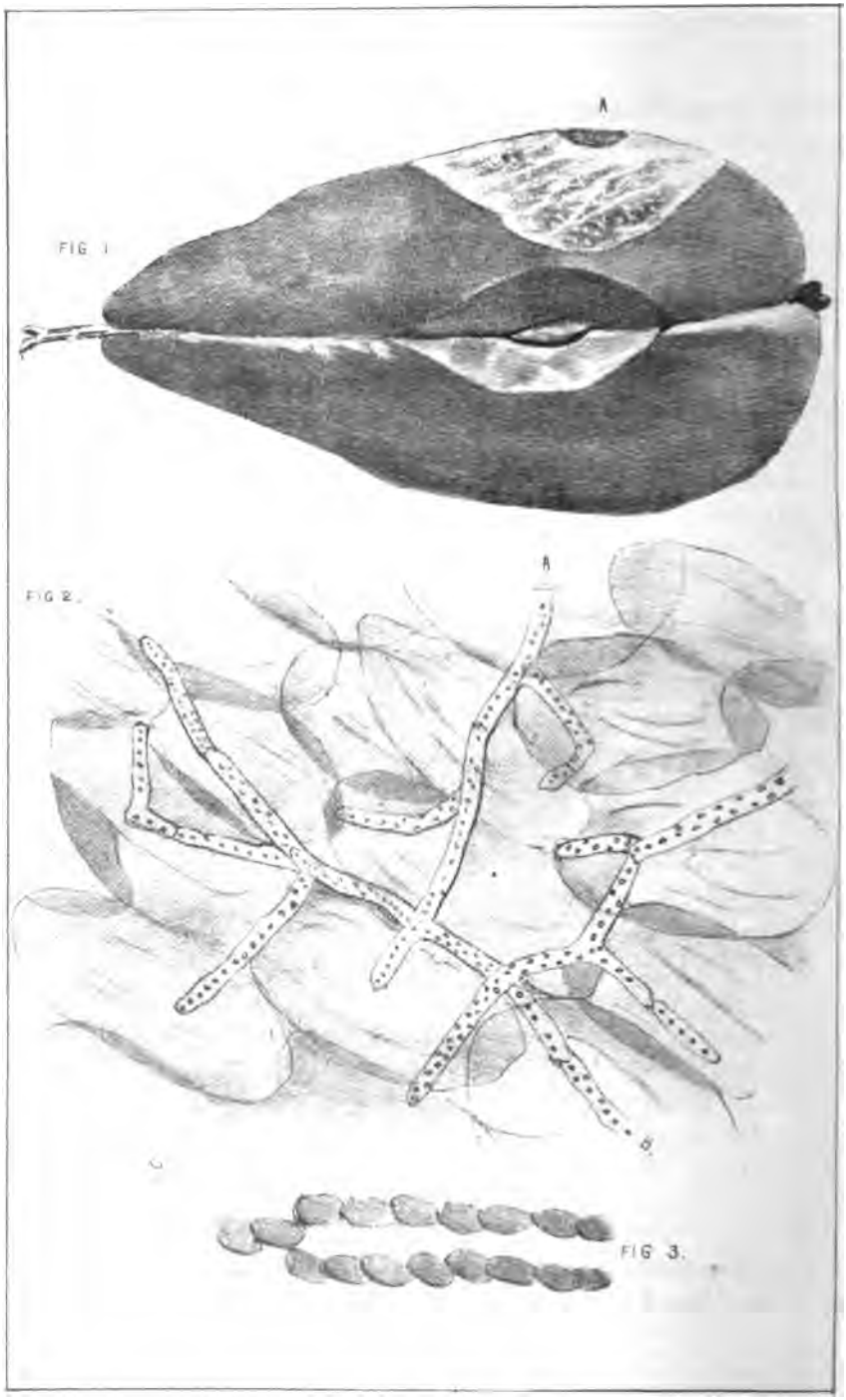
Tree No. 2. *Jalousee de Fontenoy Vendee* is a dwarf standard, growing in the open garden, (near a hotbed frame, heated by manure from the stable). It was purchased last year from Davis's Nursery, Green Lane, West Derby, and bore a large crop for so small a tree. On it, two of the pears were diseased before being gathered, and before the fruit became mellow and ripe, each pear became rotten.

Tree No. 3. *Nelis D'Hiver*, a new dwarf tree similarly purchased, also in the open garden. It bore perfectly. None of the fruit became ripe before it was diseased.

None of these trees had liquid or other manure. The garden is three years old, the soil is good loam with eighteen inches of yellow clay, and sand-stone rock below.

I have examined the fruit sent to me by Mr. Higgin, and I find it affected by a fungus, to a very considerable extent. I received some of the specimens of the *Maria Louise* apparently sound; I have therefore been able to trace the progress of the disease, and in the following observations I shall confine my remarks to this tree.

In the fruit, the disease first makes its appearance in the shape of a small thickened spot, rather darker than the natural color of the pear: this gradually becomes black and ultimately cracks. From this time a slight swelling takes place around the spot, which assumes a reddish appearance. This increases very rapidly, until the greater part of the pear is absorbed, giving the whole fruit a soft and shrivelled appearance. If a section be made through the decayed part, it is found that decomposition extends a considerable distance into the heart of the fruit, and that it is very watery in appearance. On placing a section under the microscope, the cause of this rapid decay becomes apparent, the whole of the diseased part being



FUNGUS IN PEAR

interwoven with the filaments or mycelium of a fungus, which ramifies through the tissue in every direction, until the whole of the cellular part of the pear becomes decomposed apparently to afford nourishment to the fungus.

The mycelium consists of long and very thin filaments, frequently branched, its size varying from $\frac{1}{1000}$ to $\frac{1}{1500}$ of an inch in diameter; it is often mixed with sporidæ, which are generally much broken up or dispersed in making a section for examination, but when found entire they are ranged in long rows, and when ripe assume a dark color. The plant appears to be a species of Penicillium, or is very nearly allied to that genus.

Figure 2 represents a portion of the mycelium of the plant as seen pervading the cellular tissue of the pear. (A) the mycelium in its natural state magnified 400 diam. (B) the granular contents of the articulations, and (C) the remains of the cellular tissue of the pear.

On examination of sections made through the dark spot or eye, it would appear that this is the principal seat of the fungus, and that at this spot the plant is more fully developed, and produces fructification, as shown in figure 3.

It having been supposed that in the potatoe disease the fungus first attacks the leaf and is thus communicated to the tuber through the vessels of the plant, I have endeavoured to discover traces of this fungus in the leaves of the tree, and also in sections of the branches and roots, but without success; the disease not having been observed before the autumn, it is impossible to trace its cause with certainty so late in the season.

It appears certain that the fungi are capable of multiplying by their filamentous matter, as well as by spores. This is partly proved by the common mushroom *(Agaricus campestris)* which is commonly cultivated from what is called the spawn. This spawn consists of the filamentous matter. M. Audouin found that he could as readily inoculate caterpillars and other larvæ with minute portions of the spawn of fungi as by its spores. It is believed that there is a filamentous spawn to all fungi, although seldom seen by observers, as it is developed out of sight, under ground, in the midst of decaying matter, on which fungi generally grow, or occasionally through the substance of living matter. It would appear that for the filamentous growth darkness is necessary, and that for the growth of spores

a certain quantity of light is requisite. In the present case the bulk of the fungus consist of filamentous matter.

It is curious to observe the great similarity between the present disease and several that have lately been investigated by botanists; and a study of these may, to some extent, assist us in understanding our present subject. In the potatoe disease particularly, and also in the disease which the vines, in almost all the wine-growing countries of Europe, have fallen a prey to, fungi very nearly allied to that found in the pear form a very prominent feature, and their presence is considered by some to be the sole cause, and not the effect of the disease.

In the former disease, as you are aware, the root of the potatoe, after reaching perfection, and sometimes before, is found to be covered with spots or apparently slight abrasions of the skin. These rapidly enlarge, the tuber becomes soft, and ultimately putrefies. The Rev. M. I. Berkeley attributes this disease entirely to a fungus which he believes first attacks the leaves; and so rapid is its development, that the period for examination of its leaves is past in the course of a few hours. The fungus, in his opinion, does not live on decayed matter, but is one which produces decay and renders the plant unhealthy.* Various other causes have been assigned for this extraordinary disease, but all have appeared unsatisfactory, and the subject is still involved in mystery. Professor Balfour, after reviewing the various explanations given, both chemical and physiological, says, "the general conclusions to be drawn from all that has been said relative to the potatoe disease are that changes are induced in the cells and vessels of the potatoe by certain obscure meteorological and epidemic causes; that an attraction takes place in the cellulose and in the contents of the cells, which speedily leads to decay; that parasitic *Fungi* find a nidus in the decaying organic matter, so as to accelerate and give a character to the disease; and that as yet no remedy has been devised."

The vine disease also results from a parasitic fungus, the *Oidium Tuckeri*. The ravages of this plant, as in the former case, have entailed great distress on the inhabitants of the wine-growing countries; the crops in some districts having been entirely destroyed. As yet no certain method has been discovered to stop its increase. This, like the *Botrytis infestans*,

* In the Journal of the Horticultural Society, vol. i, page 25, Mr. Berkeley enters very elaborately into this subject.

or potatoe fungus, attacks the leaves of the vine, and spreads to the fruit. It is supposed by many that it makes its first appearance in the roots, but as yet I believe there is no proof that this is the case.

The currant is the fruit of a small grape, the *Uva Corintha*. This has also suffered much; and being so commonly used as an article of food, has made almost all classes in this country familiar with the disease, indeed it is now so common that it is with difficulty that a sample of currants can be obtained without being more or less affected with the disease. The *Oidium Tuckeri* and the *Botrytis infestans* belong to the same order of fungi as that found in the pear. The disease called dry rot is also caused by the mycelium of a fungus decomposing the tissues of the wood.

It is not in the vegetable kingdom alone that these parasites are found; the animal kingdom is also attacked by them in various forms, and man suffers to a considerable extent by them. Parasitic fungi may be found in the ringworm, thrush, and many cutaneous complaints; also in that fearful and dreaded disease cancer. The muscadine so destructive to the silkworm is caused by the growth of *Botrytis Bassiana*. It is a well ascertained fact that many of the diseases commonly called blight, are caused by the growth of parasitic fungi, and the more the microscope is used the more easily will they be traced to their proper origin.

In cases like the present, however, the most important question for consideration is, how can these diseases be eradicated? and this is a subject of no inconsiderable difficulty; for when dealing with living plants or animals, we cannot apply stringent remedies without great danger of sacrificing the life of the parent plant or animal. In Kyan's process for the prevention of dry rot, the timber is impregnated with a solution of corrosive sublimate, a most powerful poison; but what living plant or animal could be so treated? hence the great difficulty experienced in stopping the ravages of disease in such cases, for most chemicals that will kill the parasite will also kill the plant on which it grows. As this disease has so lately made its appearance, it is impossible at present to suggest a remedy. Several washes however have been tried, and it is said with some success, to stop the progress of the vine disease; and as our present disease is so similar in its nature, I would suggest a similar treatment. Mr. Quarles Harris, in his paper on the vine disease, gives the following remedies as those which have been found most efficacious; and as they

have been found not to affect the health of the plant, I would suggest them as likely to be useful in this case.

1. Mix one-half of black powdered sulphur with one-half of potash; make into a wash of the consistency of usual whitewash, and with a brush paint the stems and shoots, and rub it well into all crevices.

2. Mix one-half of common sulphur with one-half of quick lime, make into a wash as above, and apply in the same manner.

3. One pound of slack lime and one pound of black sulphur, boiled for twenty minutes in five pints of water, allowed to cool and fall bright; to be then drawn off into bottles. One pint to be mixed with 100 pints of water, and the trees well syringed with the mixture.

Mr. Higgin intends to apply the last remedy, and I have little doubt that before the next fruit season he will be able to throw additional light on the subject.

Postscript.—Since the above paper was written, I have examined the fruit of a pear tree from the neighbourhood of Maghull, which has been completely destroyed by the same disease. The fruit, when examined under the microscope, presented a similar appearance to that described in the foregoing paper.

EXPLANATION OF PLATE.

Figure 1. Section of diseased pear.
A. Decayed part affected by fungi.

Figure 2. A. The mycelium in its natural state magnified 400 diameters.
B. The granular contents of the articulations.
C. The cellular tissue of the pear.

Figure 3. Fructification.

ON THE RISE OF THE MANUFACTURING TOWNS OF LANCASHIRE AND CHESHIRE.

By David Buxton, Esq.

(READ 8TH MAY, 1856.)

The towns of the Manchester District have already formed the subject of one of the papers brought before this Society, during the present session.* But the elaborate statement of Mr. Danson dealt almost exclusively with the statistical aspect of the subject, as exhibited in the results of the census of 1851. If I now travel over the same ground, it is in the hope of being able to group together various interesting details of a more general character; and so to afford those amongst us who are not intimately acquainted with the locality, a more complete view of the rise and extension of the manufacturing towns in the south-east of Lancashire and adjacent parts of Cheshire. These towns are sixteen in number, twelve of them being in Lancashire, and four in Cheshire. The former are Bolton, Bury, Oldham, Middleton, Rochdale, Heywood, Radcliffe, Ashton, Leigh, Atherton, Salford, and Manchester. The latter (the Cheshire towns) are Stockport, Hyde, Stalybridge, and Dukinfield. Now the relation which all the rest bear to Manchester is very peculiar, but the notice of it is by no means new. Dr. Percival, writing upon the population of Manchester in 1773, says,—"A considerable part of the manufactury of this flourishing town is carried on in the adjacent country, which is thereby crouded with houses and inhabitants."† And that which thus commenced with the first impetus to the cotton manufacture, has gone on ever since; and we shall find that all the surrounding towns are dependent upon the great central mart, as

* See "On the Area and Population of the Manchester District," by J. T. Danson, Esq., F.S.S. and V.P. of the Historic Society. Antè p. 165.

† Observations on the State of Population in Manchester, &c., p. 9, in Philosophical, Medical, and Experimental Essays, by Thomas Percival, M.D., F.R.S., F.S.A. London, 1776.

colonies are dependent upon the mother country; as children upon a parent; as the expanding and lengthening branches—or, more truly still, as transplanted offshoots—are related to the parent stem.

The proof of this involves so many points of interest, that I beg for a short time to call attention to them. But, first of all, it is very noticeable that, before the passing of the Reform Bill, not one of all the populous and wealthy towns which I have named possessed the privilege of parliamentary representation. To us, who know the influence which this district has exercised upon recent legislation, it appears scarcely credible that Manchester, and its tributary towns, should only have possessed the elective franchise during the last twenty-four years. Such, however, is the fact. Twelve borough members are now returned by such of the towns as were then enfranchised, viz., two each by Manchester, Stockport, Oldham, and Bolton: and one each by Salford (which in effect is part of Manchester), Ashton, Bury, and Rochdale. Since their enfranchisement as parliamentary boroughs, most of them have also become corporate towns; and besides the privileges which Manchester thus acquired in common with the other towns of the district, it has also been erected into an episcopal see, and has more recently, by a special exercise of royal authority, been dignified with the title of "city."

To shew that the extension of manufactures in the surrounding towns, is simply the extension of Manchester itself, it is only necessary to mention, that the cotton manufacture divides itself into several branches; and that for the proper carrying on of some of these—bleaching, and calico printing, for instance—certain local conditions are requisite, which a populous town cannot furnish. Accordingly, we find that bleaching has betaken itself to Radcliffe, Horwich, and the neighbourhood of Bolton; and the printing of calicos has found more congenial homes on this side of the Yorkshire, Cheshire, and Derbyshire boundaries,—on the banks of the various tributaries of the Mersey and the Irwell.* Even weaving sheds, built in a single story, are nestling down in country places, where land is cheaper, as any traveller between Liverpool and Manchester may see as he

* The only Print Works which occur to me as being within the town of Manchester are those carried on by Mr. Alderman Neild and others, under the well known firm of Thomas Hoyle and Sons. The establishment has been largely extended, and has been in existence as the Mayfield Print Works for a great number of years.

passes along. The heavier processes of carding and weaving can only be carried on upon the ground floor, or in the lowest stories of a building; but spinning and the lighter operations may be as well or better conducted in the upper stories. Even cotton spinning itself, however, must reach its limits in a town like Manchester, where the area is covered, and property is becoming daily of greater value. And it has done so. Old factories are sometimes enlarged, but new ones are not built *there*. They are built out in some convenient spot in the *district*: and this extension of the smaller towns is as much a sign of the expansion of Manchester proper, as the construction of docks on the north shore, or the building of residences at Aigburth or Roby, is a proof of the expansion of Liverpool. It may seem strange to say so, but the fact is, that Manchester is becoming (in proportion to the whole aggregate of production) less and less the chief *manufacturing town*, and more and more the central *mart* for the whole manufacturing district. Of the hundreds of manufacturers who throng the Manchester Exchange every Tuesday at mid-day—representatives of the wealth, and energy, and skill, which are embarked in the staple trade of the place—I doubt if more than one in ten lives, not in the town *itself*, but *anywhere* within the parliamentary boundaries of Manchester and Salford.

Take another illustration of the same fact. There are many names known far beyond the immediate locality where they were first known, and which have become bound up not only with local but with national history. All the world will tell you that the original Sir Robert Peel was a Manchester manufacturer, and that Mr. Cobden's first essay in public was as the author of a pamphlet, in which he assumed the same general designation.* Yet what are the facts? The warehouse of the Peels was in Manchester, but their works were at Bury; that of the Cobdens was also in Manchester, but their works were at Clithero. Mr. John Feilden, (who, as M.P. for Oldham, carried the *Ten Hours Act*,) had his place of business in Manchester too, but his works were at Todmorden. And there are at this moment many others whose names are extensively known in connection with the place, and with the cotton manufacture, who though they are popularly considered as belonging to Manchester, (and though some of them actually

* "England, Ireland, and America, by a Manchester Manufacturer." This publication appeared about twenty years ago.

do reside there, and all of them have their places of business in the town,) still have their works situated in various parts of the surrounding country. Thus the works of the present member for Manchester, Mr. John Bright, are at Rochdale; those of his predecessor in the representation, Mr. R. H. Greg, are at Caton, near Lancaster, and at Bollington, in Cheshire. Among the ex-mayors of the town are Sir Elkanah Armitage, and Mr. Kershaw, M.P. The works of the latter are at Stockport; and those of the former at Pendleton,—a suburb of Manchester, which is in the borough of Salford, but in the parish of Eccles. The manufactory of Mr. J. Cheetham—M.P. for this division of the county—is at Stalybridge, and that of Mr. Charles Hindley, M.P., at Dukinfield; though both are popularly considered and called "Manchester men." And not needlessly to extend the list, I will only add, that the Messrs. Grant, of Manchester, (the "Cheeryble Brothers," of *Nicholas Nickleby*,) had their works, not in the town where their warehouse is situated, but at Ramsbottom, near Bury.

Again, a borough town, or any place possessing a considerable population, or independent means of wealth, will generally be found to possess its own newspaper, and its own local bankers. Now I will venture to say, that nowhere throughout the United Kingdom (though the district round Leeds may afford a somewhat similar case) will you find such large masses of people congregated together, and so much visible wealth accumulated, with such a remarkable absence of these accompaniments, as in the tributary towns now under consideration. And why? Because the Manchester papers are the press of the district, and the bankers of the district are the banking firms or companies who conduct their business in Manchester. As regards the press, though the Manchester papers circulate through the district, and form the only issue of any account, I am not unaware that there have existed, or do exist, a few local prints in those places which return members to parliament; and where, consequently, political differences, and occasional party contests, tend to support the organs of public discussion. But the insignificance of these existing exceptions, and the ephemeral life of some which exist no more, are only corroborations of the general statement which I have just made. To test the assertion fairly, one must not look at the state of things since the repeal of the newspaper stamp, but go back to a period which shews more unexceptionably the ordinary conditions of these localities. From a publication issued in 1852,

purporting to give a list of all the newspapers published in Great Britain in the year 1850, with the number of stamps issued to each, I cannot find that there was at that time any newspaper published in Ashton, Hyde, Stalybridge, Oldham, Middleton, Rochdale, Bury, Heywood, Radcliffe, Atherton, Leigh, or Dukinfield: while in Bolton there was one paper, to which, in 1850, 72,000 stamps were issued; and in Stockport, two papers, to one of which 14,980 stamps had been appropriated, and 28,500 to the other. To the four papers published in Manchester, the issue had been, during the same period, nearly two millions, viz.—1,916,910. And if it were worth while to examine how far the question under review is illustrated by the banking system of the district, we should find that with the exception of about three private firms, four or five local Joint Stock Banks, and several branches and sub-branches of the Manchester and Liverpool District Banking Company—five towns being without any provision at all, and three more possessing only one of these branches—the whole banking business is transacted in Manchester; the firms and companies situated there being, in fact, not the bankers of the town alone, but of all the surrounding district.

I will now endeavour to point out some of the causes which either have determined the original establishment of manufacturing enterprise in these places, or have led to their rapid increase in wealth, population, and national importance. Manchester is not a new town. I need not go into its history, or investigate its date. In the reign of Henry VIII. it is spoken of as "well inhabited, and distinguished for its trade in linens and woollens;" and in an act of parliament, passed in the following reign, mention is made of "Manchester, Lancashire, and Cheshire Cottons; and of Manchester rugs and friezes." It was not until the middle of the last century that the cotton manufacture began to assume that importance which has led to the enormous increase in all the attributes of prosperity which characterise this district; and Liverpool also, as the port of the district. The importation of raw cotton into this country, which in 1701 was under two millions of pounds, and in half a century later had not increased to three millions, sprang up between 1751 and 1780 to nearly six and three quarter millions; in 1790 it reached thirty-one and a half millions; and in another ten years increased more than 75 per cent., shewing an augmentation of imports, within the century, from 1,985,868 pounds to fifty-six millions of pounds.

Simultaneous with this, was the increase in the value of the cotton goods exported; as will be seen by the following table:—

Year.	Cotton Wool Imported. lbs.	Cotton Goods Exported. Official Value
1751	2,976,610	£45,986
1764	3,870,392	£200,354
1780	6,700,000	£355,060

In seven years more, when the strenuous efforts which had been made to overthrow Arkwright's patents had been successful, the amount of exports rose immediately to the value of £1,101,457. These figures shrink, of course into insignificance by the side of the present returns; * but they indicate when it was that the first bound, in the rapid increase which is still progressing, actually took place. A glance at the table just given will show that it was about 1763 or 1764. In the former year, the seven years' war, which secured to England the possession of Canada, was brought to an end.† In the same year, the traffic between Liverpool and Manchester was carried on by a fleet of eight river flats. But this imposing line of transports did not long suffice. In the same year, the Spinning Jenny was invented. The two requisites to the developement of our local resources, which has since taken place, were first, suitable machinery, and second, readiness of communication. Both were supplied, almost simultaneously. From this point may be dated the marvellous growth of the cotton manufacture, and of local prosperity. The slow and laborious processes, which are recorded in the very name MANU-*facture*,

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*The returns of some subsequent years, and those which have been most recently published, will enable any one who is interested in the subject, to institute the comparison here suggested:—

Cotton Wool Imported.

1800.	1823.	1845
56,000,000 lbs.	187,231,520 lbs.	721,980,000 lbs.

For the first *three months* of 1855, the quantity imported was 174,695,584 lbs., and for the first *quarter* of the present year, 206,494,736 lbs. The value of the Cotton goods exported, has increased as follows: —

1834.	1835.
£13,783,375	£15,306,922

During the first *quarter* of 1855, the declared value of the manufactured Cotton goods exported, (exclusive of twist), was £6,176,520, and for the corresponding period of the present year it was £6,723,390—that for the month of March alone being £2,476,378—or nearly at the rate of thirty millions per annum.

†"The rapid increase of Manchester commenced about the year 1765, after the conclusion of the last war."—Dr. Percival: *Essays, ut supra, p.* 29.

were now superseded, and every suitable climate in the world was henceforward laid under contribution, to furnish the raw material upon which this great enterprise subsists as its natural food.* In 1760 the carding machine, invented by Lewis Paul, to be used in the woollen manufacture, was introduced into Lancashire, and applied to cotton. In 1764, calico printing was first brought into this county, though not applied with much effect, until taken up by the Peels at a later period. In 1769, Arkwright's first patent for the "water frame" spinning machine was issued; and also Watt's first patent for his discovered improvements in the steam engine. In the following year (1770), the spinning Jenny, invented by Hargreaves, was patented, though the principle had been discovered, as just stated, four or five years before. Five years later, (in 1775,) Arkwright's second patent was taken out, for his carding, drawing, and roving machines. From 1776 to 1779, Crompton was working his way to the invention of the mule spinning frame, though it scarcely came into use, until after the success of the attempts which were repeatedly made to overthrow the patents of Arkwright. This was in 1785—a year of great importance. In this year it was that Cartwright obtained the first patent for his power-loom; Boulton and Watt applied their first engine as the motive power in the cotton manufacture; and the printing of calico from cylinders was introduced. But to make these discoveries and improvements practically valuable, readiness of communication was also essential: and this was supplied simultaneously, by an extensive system of canal navigation, by means of which the raw material was brought in to be worked, and the manufactured article could be either returned to Liverpool for shipment, or forwarded to the various home markets for domestic consumption. The act for

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*The following table exhibits the various sources of supply, and their relative importance:—

Raw Cotton imported during the three months ending March 31st, 1856, and in the corresponding period of 1855.

	1856.	1855.
United States	1,590,661 cwts.	1,431,234 cwts.
Brazil	38,856 „	28,414 „
Egypt	37,527 „	23,908 „
British India	171,110 „	75,222 „
Other Parts	5,549 „	1,004 „
Total cwts.	1,843,703	1,559,782

making the Sankey and St. Helen's Canal (the first in England), had been obtained in 1755. The greater work, which we owe jointly to the energy and perseverance of the Duke of Bridgewater, and the genius of John Brindley, was authorised by Parliament in the session of 1758-9, and opened in 1762. Between 1791 and 1794, acts were obtained for the construction of separate canals from Manchester to Bury and Bolton, to Ashton and Oldham, and to Rochdale: and by means of various branches and extensions, a complete system of water communication was speedily established, not only with the towns of the immediately surrounding district, but extending into the neighbouring counties and to remoter places.* Without the facilities of transit which were thus supplied, the prosperity of manufacturers, which increased at such a rapid rate at the time now spoken of, would have been an utter impossibility. The only towns in the district which are accessible by river communication, are Stockport and Manchester, and the Irwell has been made navigable up to Manchester only by artificial means.

The circumstances which determine the locality of manufactures, will be found to resolve themselves generally into—I, Convenience of site: and II, Facility of transit. Convenience of site implies in the present instance that there shall be (1) a copious supply of water: (2) a cheap supply of coals, arising either from the proximity of the mines, or from cheapness of conveyance: (3) a suitable and sufficient population: and (4) no pre-occupying or more important business, or one more convenient to be carried on in that locality.† The principle which governs these matters is not that of local exigency, (or we should have manufactories in every populous town) but of local convenience. And we may see on every side how natural is the tendency, in all the more extensive forms of

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*It is estimated that the canals now open in England, are 2800 miles in length; and that we have also 2500 miles of navigable rivers, which have been partly made so by artificial means.

†When we consider how the maritime trade of Liverpool has swallowed up every other, and driven out, as if they had no right to a footing within its borders, the manufacture of pottery, and the craft of watchmaking; and that, in rebuilding the only cotton factory ever erected here, it has been turned into a flour mill,—it is evident that this last consideration is a very important one. The attempts which have also been made in other places, e.g., at Hull, Bristol, and elsewhere, to introduce the cotton and other manufactures, (and which, if they have not failed entirely, have certainly not sufficiently encouraged the experiment to warrant its extension,) are additional evidence to the same effect.

manufacturing enterprise, to fix themselves, and to spread out, in some convenient locality. Thus the cotton manufacture is chiefly carried on in and around Manchester; the broad cloth trade is in that district of the country which is popularly known, in this very connection, as "The West of England;" the coarser and heavier woollen fabrics are made in the West Riding of Yorkshire; the principal iron works are in those parts of the counties of Stafford and Worcester, which are known as the "black country;" the making of earthenware has acquired for a neighbouring district the name of "the Potteries;" and the smelting of copper and other ores is peculiar to Glamorganshire. The presence of minerals does of necessity fix a certain amount of industry to the spot where they must be worked; but the genius of manufactures is more erratic. She may and does wander about to find the likeliest spot to settle in, but when it is found, it becomes the ample home of a prosperous and ever-increasing progeny.

The facilities of transit which were furnished by canal conveyance, soon became inadequate to the trade which its establishment had helped so largely to develope.

A declaration of 150 merchants of Liverpool, issued in 1824, set forth that they had "for a long time past experienced great difficulty in obtaining vessels to convey goods from this place (Liverpool) to Manchester, and that the delay was prejudicial to the trading and manufacturing interests at large:" that the existing means of transport (i.e., the Irwell and Mersey navigation, and the Bridgewater canal) were "quite inadequate," and "that a new line of conveyance had become absolutely necessary to conduct the increasing trade of the country with speed, certainty, and economy." In 1830, Liverpool and Manchester were linked together by the present line of railway, and in process of time most of the larger towns in the manufacturing districts were placed in direct commmunication with Manchester, as the various projects to which the success of the original experiment gave rise, were carried into effect.

Yet, it must not be supposed that the water route is entirely superseded. There are peculiar advantages to the manufacturer in the proximity of the canal. His chief and indispensable requisites are cotton and coals. Both are very bulky; both very inexpensive in proportion to their bulk; and neither, therefore, will bear a heavy rate of freight. Besides the

other advantages of a waterside position, there is this: that both these articles may thus be easily delivered, and cheaply conveyed; the canal boats can be brought alongside, and even run into the factory yard; and their contents can be laid down upon the very spot where they are required for use. Where these conveniences are wanting, there must be the additional item of cartage introduced into the cost; and this, where constant consumption necessitates constant supply, must amount in the aggregate to a sum sufficiently considerable to make exemption from it worth trying for. The consequence is, that nearly all but some of the oldest mills,—as Houldsworth's, and that of the Oxford Road Twist Company, in Manchester—stand upon the banks of the numerous canals which intersect the district.

The original position of the various branches of the cotton manufacture in the places where it is now carried on, and which have grown into large towns from insignificant villages,—multiplying wealth "beyond the dreams of avarice,"—was undoubtedly determined by their possession of the means of water power; though this advantage soon became of little value, on the application of steam as the principal motive power. The situation of Stockport is where the Tame and the Goyt uniting form the Mersey. Upon the first of these streams stand Ashton, Dukinfield, Hyde, and Stalybridge. Manchester stands at the confluence of three rivers,—the Irwell, the Medlock, and the Irk. The two last-named are nowhere navigable, in any part of their course; and the first, though rendered navigable up to Manchester, ceases to be so at that point. Nearer to its source, it flows past Bolton and Bury: and the Medlock, higher up, passes Oldham; while Rochdale and Heywood stand upon the bank of another small stream, from which the former town takes its name—the Roach. These facts, it is manifest, bear strongly upon the point of original situation; and, as regards development, it is noticeable, that all these towns possessed canal communication more or less complete, and that the relative importance to which they had severally attained, is strikingly attested by the position which each assumed in the railway system. The presence or absence of a railway is in itself a fact of great significance, in the consideration of a question like this. The projectors or managers of a railway can only regard a group of towns under one aspect.

Their wisdom is to calculate
What [traffic] they will yield.

Thus the large towns are chosen as stations or termini, and they become larger; the smaller towns are passed or avoided, and they become smaller. The first shoot faster onward: the latter lag more in the rear. After Manchester became connected with Liverpool, lines of railway were continued or opened to Wigan, Preston, and Bolton; then to Rochdale, Heywood, and Todmorden, and so on to Leeds: and now the great centre of the district is accessible by railway, from nearly every one of its manufacturing dependencies. To some of them, indeed, this advantage has accrued somewhat tardily, and also indirectly. Those places received it latest which could wait the longest; as they were only included in the plans of rival companies, when the more remunerative towns were already supplied, and the zeal for railway extension set in rather too strongly for the interests of shareholders, however beneficial it may have been in other respects.

And now, on looking back, and comparing the present with the past, we see how, in less than a century of time, there has been wrought a very miracle of progress. The contrast is one which must astound even those who are most familiar with the facts. The population of Manchester and Salford, which in 1757, was 19,839, had increased in 1851 to 401,321. Liverpool, which in 1750 had 22,099 inhabitants, at the last census contained 375,955 souls, within the borough alone, exclusive of the environs. Between the years 1773 and 1851, the population of Bury increased from 2,090 to 31,262; and that of Bolton from 4,568 to 61,171. The importation of raw cotton, which in 1751 was under 3,000,000 lbs., had risen in 1800 to 56,000,000 lbs., and for the first three months of the present year, it was at the rate of 206,500,000. The export of cotton manufactured goods, of which in 1751, the declared value amounted to no more than £45,986, reached in the month of March last the sum of £2,476,378, or nearly £30,000,000 sterling per annum. The cotton manufactories of all kinds, in England (exclusive of Scotland and Ireland), were, in 1850, 1,753 in number: of which 1,235, or 70 per cent. were in the county of Lancaster alone, and 145, or 8¼ per cent. in Cheshire. The proportion of water to steam power employed in the cotton manufacture throughout the country was 13

per cent: but in Lancashire it was little more than 7 (actually 7.2) per cent. Instead of the hand processes, or the imperfect contrivances which retarded rather than promoted the growth of this enterprise a century ago, there was found in the factories of Lancashire a mechanical force equal to 50,286 horse-power, (in the proportion of 3,376 of water, to 46,910 of steam), and this was employed in turning 13,955,497 spindles, and propelling 176,947 power-looms.* At the same time the success which has been attained in the construction of the machinery and mechanical appliances of the cotton manufacture, has given not a local celebrity merely, but a world-wide reputation to the names of Fairbairn, Sharp, and Whitworth of Manchester, Platt of Oldham, and Nasmyth of Patricroft. And, lastly, it is worthy of notice, as a very significant proof of its wonderful prosperity, that a tract of country almost entirely destitute naturally of the water-way which is the wealth of other countries, has been supplied by skill and enterprise, with lines of canal communication and a vast net-work of railways, which bring every needful article to its own doors, and carry its products forth to every home in the country, and for distribution to every nation in the world. So that, independently of all differences of opinion, or possible diversity of interest, there can be no question whatever upon this point—that in growth of population, in rapidity of extension, in developement of resources, in the wealth which these conditions represent, in the ever-active spirit of enterprise which influences and urges and directs the whole, and in the social and national importance which fitly waits upon such extraordinary success, no district in Her Majesty's dominions can be placed in comparison with that southern division of the county of Lancaster, in which we live: and which depends as much, for its marvellous prosperity upon Liverpool and Manchester equally, as the colossal steamer, which brings New York as near to us as London used to be, depends upon the simultaneous action of *both* its paddles for its propulsion and progress.

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* See Table on the next page; extracted from the collection of Parliamentary papers in the Liverpool Free Public Library. For other assistance in the compilation of this paper, I am indebted to a work on the History of Manchester, published in 1836, by James Wheeler, Esq., of the Northern Circuit.

ABSTRACT OF A RETURN OF THE NUMBER OF COTTON AND OTHER FACTORIES, SUBJECT TO THE FACTORIES' ACT, ORDERED BY THE HOUSE OF COMMONS TO BE PRINTED, 15TH AUGUST, 1850.

COTTON FACTORIES.

FACTORIES EMPLOYED IN SPINNING.

	No. of Factories.	No. of Spindles.	No. of Power-looms.	Amount of Moving Power.		Total Numbers Employed.		
				Steam.	Water.	Male.	Female.	Male & Female.
Cheshire	76	816,680	..	1,853	229	4,025	2,911	6,936
Lancashire	517	6,110,074	..	16,102	1,340	26,165	29,847	56,012
Total for England (i.e., in counties of Chester Cumberland, Derby, Lancaster, Middlesex, Nottingham, Stafford, and York)	762	8,685,392	..	21,094	3,925	38,284	42,260	80,544

FACTORIES EMPLOYED IN WEAVING.

Cheshire	6	..	842	83	20	222	200	422
Lancashire	196	..	31,875	2,538	152	8,045	11,629	19,674
Total—(i.e. in Chester, Cumberland, Derby, Lancaster, and York)	229	..	36,544	2,840	370	9,173	13,216	22,389

FACTORIES EMPLOYED IN SPINNING AND WEAVING.

Cheshire	58	1,472,439	28,224	6,792	643	12,550	15,707	28,257
Lancashire	496	7,766,991	143,690	27,612	1,820	61,125	74,135	135,260
Total—(i.e. in Chester, Cumberland, Derby, Gloucester, Lancaster, Stafford, and York.)..	540	10,055,410	184,816	37,368	3,170	79,967	96,809	177,976

FACTORIES NOT INCLUDED IN EITHER OF THE ABOVE DESCRIPTIONS.

Cheshire	5	5,584	132	16	23*	80	77	157
Lancashire	86	78,432	1,382	658	64	1,691	3,346	5,037
Total—(i.e. for Cumberland, Chester, Derby, Lancaster, Leicester, Middlesex, Norfolk, Nottingham, Stafford, Surrey, Warwick, and York.)	222	433,167	2,266	1,638	717	4,186	7,767	11,953
Total of Cotton Factories it England.	1,753	19,173,969	223,626	62,940	8,182	131,610	160,052	292,862
Total in Lancashire.	1,235	13,955,497	176,947	46,910	3,376	97,026	118,957	215,983

Mem. by Mr. Horner: The return of cotton and silk factories in my district is incomplete; for Messrs. John Bright, & Brothers, who have two factories in Rochdale, and one at Collyhurst, near Manchester, and Messrs. T. J. & T. Walker, of Leigh, near Manchester, have refused to make the return called for.

* The disparity between the proportion of steam and water-power in the manufacturing and non-manufacturing counties, may be shown by comparing Chester, Derby, and Stafford, with York and Lancaster:

	Steam-power.	Water-power.
Lancaster	658	64
York	258	46
Derby	136	323
Stafford	91	133
Chester	16	23

This refers only to the factories included under the fourth denomination.

RESULTS DEDUCED FROM OBSERVATIONS, TAKEN WITH THE SELF-REGISTERING ANEMOMETER AND RAIN-GAUGE, AT THE LIVERPOOL OBSERVATORY, DURING THE FOUR YEARS ENDING DECEMBER 31, 1855.

By John Hartnup, Esq., F.R.A.S., V.P.

(Read 17th April, 1856.)

The instrument above-named was erected by Mr. Follett Osler, in the autumn of 1851. At the Liverpool Meeting of the British Association, in 1854, Mr. Osler gave a brief history of the invention of the instrument, and I supplied him with various tables of results, and such information as was necessary to illustrate its performance. This communication, including the tables and diagrams which had been prepared, was ordered to be printed entire in the proceedings of the Association, and it will appear in the volume for 1855, together with the results of observations for that year. The printing of the tables, and the engraving of the plates, will involve a considerable expense, and as they were thought to possess considerable local interest, Professor Phillips, the Secretary of the Association, kindly gave permission for as many copies to be struck off as might be required for the next volume of the Historic Society.

In the instrument to which we have alluded, the arrangements are such, that the pressure of the wind in pounds on the square foot, the horizontal motion of the air in miles for any required interval, and the direction of the wind, are continuously recorded on sheets of paper. The time at which it commences to rain, the rate at which it falls, and when it ceases to fall, will also be found recorded on the same sheets of paper. At an elevation of about thirty feet above the roof of the observatory, a pressure plate of four superficial feet is kept facing the wind by means of a set of small vanes. This plate is urged in opposition to the wind by eight springs, so arranged that a slight spring comes into play with a light wind, and stronger springs are made to act in conjunction with the first successively

as the plate is driven back by the force of the wind. A chain from the pressure plate passes over a pulley and communicates with a wire which passes through a vertical spindle, and is held tight at the bottom by a slight spring; by this wire a pencil is moved transversely to the direction in which the paper, intended to receive the record, is carried by a clock. Lines are printed on the paper which correspond to the different values of the pressure; the intervals of these lines were adjusted by applying weights of 4lbs., 8lbs., &c., to move the pressure plate in the same manner as if moved by the force of the wind. The vanes which keep the pressure plate facing the wind are made to turn the vertical spindle, and by means of a spiral groove near the bottom of the spindle a rod is raised or depressed. This rod carries a pencil which is moved, when the direction of the wind changes, transversely to the direction in which the paper is carried by the clock. Lines are printed on the paper which correspond to the positions which the direction pencil must take when the pressure plate faces the different points of the compass; the paper has also transverse lines which correspond to the positions of the pencils at every hour. The direction pencil was adjusted by placing it on the south line when a vane placed over the transit instrument was seen, during a brisk wind, to point to the meridian mark. The meridian mark of the transit instrument is three miles distant from the observatory.

The receiving surface of the rain-gauge is 30 feet above the ground, and it exposes to the rain a surface of 400 square inches. The collected water passes through a tube into a glass vessel; the glass vessel is made to descend by the weight of the water, and in its descent a pencil is carried with it. When a quarter of an inch of rain is collected, the glass receiver discharges itself by means of a modification of the syphon, and the pencil ascends to the zero line. The scale of the printed paper was adjusted by filling the water vessel until it emptied itself, and then by weighing the water its bulk was ascertained.

The velocity of the air is obtained by means of a horizontal windmill, having for its vanes four hemispherical cups; the action of the wind on the concave surfaces exceeds that on the convex; and Dr. Robinson has found (Transactions of the Royal Irish Academy, vol. xii., part 3,) in a windmill thus constructed, the centres of the cups move with one-third the velocity of the air. The hemispheres are eight inches diameter, and the

distance of their centres from the axis of rotation is three feet. A vertical spindle connected with the horizontal windmill works in a cup which is kept nearly filled with Young's patent mineral oil; this spindle is made to turn a cylinder, the circumference of which is 27.8 inches. The paper which receives the record is stretched tight over the cylinder, and for every inch of paper worked off, the centres of the hemispheres travel 12.75 miles, or 38.25 miles of air passes over the station. The results have been tabulated on this assumption.

The paper on which the tracings are made by the pencils of the self-registering instrument are preserved for future reference, but the results are regularly tabulated.

Tables I and II are copies of the records for one month, shewing how they are tabulated daily from the registers given by the instrument.

Table I part 1, gives the horizontal motion and direction of the wind for every hour of the day; the latter is indicated by a figure, the sixteen points of the compass being numbered in rotation, commencing with N.N.E. No. 1, N.E. No. 2, &c.

Part 3, table II, is an abstract of the above, and shews the daily amount of horizontal motion from each point of the compass, and the number of hours each wind continued.

Part 4, table II, is obtained from the rain-register, and shews the quantity of rain in thousandths of an inch that fell in each hour during the month.

Part 2, table I, contains the daily totals obtained from the hourly records of the wind and rain as above described, together with the extreme pressure of the wind in pounds on the square foot for each day, and the time at which it occurred.

From the monthly sheets, of which tables I and II are specimens, the annual tables III and IV are obtained. In table III the results are arranged according to the points of the compass, and in table IV according to the hours of the day. It is unnecessary to enter on a detailed description of these, as it is hoped that the heading of each table and column affords sufficient explanation.

The tracings contained in plate M have been reduced from the large scale on which they were first drawn for exhibition, at the meeting of the British

Association, in Liverpool. They were laid down directly from the worked paper of the integrating instrument, according to the method suggested by Dr. Whewell. They shew the path of the wind, or the direction in which a particle of air passing directly over the observatory would be carried during each of the four years. These tracings for the different years, it will be seen, bear but little resemblance to each other, with the exception of the general tendency of the air to move from West towards East; and the motion of the air in this direction during the year 1854, was much greater than it was during either of the other years.

The diagrams in plates **N**, **O**, **P**, and **Q**, have been prepared by Mr. Osler, from the results given in tables III to VIII inclusive, with the view of conveying a more comprehensive perception of the results than can readily be obtained by consulting tables in which there are so many figures. The method also greatly facilitates the comparison of different years with each other. In the first row of diagrams in plate **N**, the various winds are classified, so as to shew the relative amount for different years, and a remarkable coincidence is observable.

In the second row of diagrams, the hours during which each wind has lasted are compared, and in these the resemblance that the different years bear to each other is even more striking.

The average hourly rate at which each wind travels, is shown in the third row of diagrams, plate **N**; from this it will be seen that all those winds having a westerly bearing travel very much the fastest. Those from the S. to the E. proceed at a much slower rate, while such as come from the North-east average but a little more than one-third the rate of the Westerly winds (for the exact rates see table III, column 6.)

With reference to the results obtained from the Rain-registers, the first row of diagrams, plate **O**, gives a comparative view of the amount of rain which accompanied each wind, while the second row exhibits the number of hours it occupied in falling; from these the hourly rate is at once obtained, and the result is shewn in the third row of diagrams on the same plate. In addition to this, the quantity of rain compared with the amount of air that passed over the station has been taken out (see table III, column 13), and a diagram (see plate **P**, fig. 2) is given, showing the mean quantity of rain that falls to every thousand miles of air from each point of the compass. By this it will be observed that for every 1000 miles of air the North-

easterly winds, which are the lightest, bring with them a much larger proportion of rain than those from any other point.

Table V gives the hourly amount of rain, and is illustrated in fig. 1, plate P. As far as four years are capable of indicating, it would appear that the minimum amount of rain falls during the first three hours after midnight, and that there are three periods in the day when an increased amount of rain falls, namely, between seven and eight o'clock in the morning, between one and two in the middle of the day, and between eight and nine in the evening; but before any satisfactory conclusions can be arrived at on this subject, it will be necessary to obtain averages for a longer period.

Table VI gives the average hourly motion of the air in miles for each month, direction not being regarded. The tracings shewn in fig. 3, plate P, exhibit the comparative results given in this table, by which it appears that the greatest amount of motion in the air takes place in the months of December, January and February. November seems to be the stillest month in the year, and March, which is usually considered such a windy month, is in fact one of the four in which the least amount of motion in the air occurs, while April is only surpassed by the three winter months mentioned above.

Table VIII, like the preceding, gives the mean hourly motion of the air without regard to direction, but instead of referring to the months, shews the amount of motion between any one hour of the day and the next hour following, for each of the four seasons. This is illustrated in plate Q, in which a remarkable coincidence will be seen to exist between the curves and the temperature at the different hours of the day.

The value of the observations will necessarily increase with their progressive accumulation. There are, doubtless, many interesting results which still remain to be worked out from the records which we already possess, and I trust that the method which we have devised of tabulating the observations (see specimen tables I and II*) will be found to render it a comparatively easy task to work out such results as may at any future time be thought desirable.

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* The illustrative Tables and Plates are inserted between this and the next numbered page.

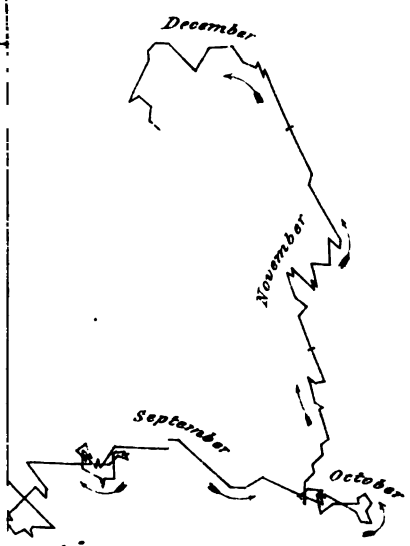
Part 3.

an inch

1855. July.	N.N.E. 1		N.E. 2		E.N.E. 3		E. 4	12	13
	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.		
1	....	..	..	..	9	2	4	....	....
2	....	..	....	..	....	..	7	....	....
3	....	..	....	..	....	..	....	....	....
4	....	..	....	..	....	..	....	....	....
5	....	..	6	1	8	1	11	....	....
6	....	..	....	..	....	..	11	....	....
7	....	..	...	..	....	..	....	....	....
8	....	..	....	..	....	..	....	....	....
9	....	..	....	..	....	..	57	....	....
10	4	1	....	..	48	5	70	....	....
11	2	1	....	..	3	1	....	....	....
12	4	1	....	..	....	..	....	....	....
13	....	..	....	..	....	..	....	....	....
14	....	..	....	..	....	..	....	086	·012
15	....	..	....	..	....	..	...	....	....
16	....	.	....	..	....	..	...	030	·032
17	....	..	....	..	....	..	....	....	....
18	....	..	....	..	....	..	....	....	....
19	....	..	....	..	....	..	....	....	....
20	....	..	....	..	....	..	....	....	....
21	....	..	....	..	....	..	....	....	....
22	....	..	....	..	....	..	....	....	....
23	34	7	4	2	....	..	....	....	....
24	35	6	....	..	....	..	....	005	....
25	....	..	....	..	....	..	....	030	·070
26	....	..	....	..	....	..	....	....	....
27	....	..	....	..	....	..	....	....	....
28	....	..	....	..	....	..	....	....	....
29	....	..	....	..	....	..	....	....	....
30	....	..	....	..	....	..	....	....	....
31	....	..	....	..	....	..	....	·081	·090
Sum ..	79	16	10	3	68	9	160	·232	·204

which fell during each hour.

14	15	16	17	18	19	20	21	22	23	24	July.
...	....	....	....	....	....	....	....	....	....	....	1
...	....	....	....	....	....	....	....	....	....	....	2
...	....	....	....	....	....	....	....	....	....	....	3
...	....	....	....	....	....	....	....	....	....	....	4
...	....	....	....	....	....	....	....	....	....	....	5
...	....	....	....	....	....	....	....	....	....	....	6
...	....	....	....	....	....	....	....	....	....	....	7
...	....	....	....	....	....	....	....	....	....	....	8
...	....	....	....	....	....	....	....	....	....	....	9
...	....	·045	....	....	....	....	....	....	....	....	10
...	....	....	....	....	....	....	....	....	....	....	11
...	....	....	....	....	....	....	·010	....	....	....	12
...	....	....	....	....	....	....	....	·058	·032	·015	13
...	....	·030	....	·205	....	....	....	....	....	....	14
...	....	....	....	....	....	....	....	....	....	....	15
...	....	....	....	....	....	....	....	....	....	....	16
...	....	....	....	....	....	....	....	....	....	....	17
...	....	....	....	....	....	....	....	....	....	....	18
...	....	....	....	·004	....	·004	....	....	....	....	19
...	....	....	....	....	....	....	....	....	....	....	20
...	....	....	....	....	....	....	....	....	....	....	21
...	....	....	....	....	....	....	....	....	....	....	22
...	....	....	....	....	....	....	....	·020	·033	·160	23
...	....	....	....	....	....	·055	....	....	....	·250	24
·060	·085	·135	·120	·020	·132	·032	·111	·135	·020	·008	25
...	....	....	....	....	....	....	....	....	....	....	26
...	·123	....	....	....	....	....	....	....	....	....	27
...	....	....	....	....	....	....	....	....	....	....	28
...	....	....	....	....	....	....	....	....	....	....	29
...	....	....	....	....	....	....	....	....	·018	·014	30
·184	·042	....	....	....	....	....	....	....	....	....	31
·344	·250	·210	·120	·229	·132	·091	·121	·213	·103	·447	


December
November
September
October

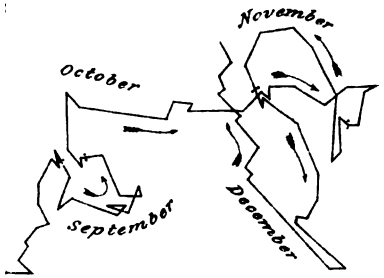

November
October
September
December

TABLE III.—Abstract of Results derived from the Integrating Anemometer and Rain-gauge arranged according to the direction of the wind. 1852. See Plates N and O.

Points of the Compass.	Whole amount of horizontal motion of the air.	Relative amount of horizontal motion of the air. (Mean = 1·00.)	Number of hours in which the direction of the wind was referred to each point.	Relative time the direction of the wind was referred to each point. (Mean = 1·00.)	Average hourly horizontal motion of the air from each point.	Relative hourly horizontal motion of the air. (Mean = 1·00.)	Whole fall of rain arranged according to the direction of the wind.	Relative fall of rain. (Mean = 1·00.)	Whole time in hours during which rain fell.	Relative time during which rain fell. (Mean = 1·00.)	Average hourly rate at which rain fell.	Mean quantity of rain to every 1000 miles of air.
	Miles.		Hours.		Miles.		Inches.		Hours.		Inch.	Inch.
N.N.E.	2,488	0·35	*426	0·78	5·8	0·48	†2·353	1·20	34·3	0·80	0·069	0·945
N.E.	1,239	0·17	198	0·36	6·3	0·50	1·158	0·59	20·0	0·47	0·058	0·934
E.N.E.	2,799	0·39	320	0·58	8·7	0·69	1·439	0·73	24·2	0·57	0·060	0·514
E.	4,708	0·66	427	0·78	11·0	0·89	1·408	0·72	30·9	0·72	0·046	0·299
E.S.E.	4,134	0·58	423	0·77	9·8	0·79	1·487	0·76	27·5	0·64	0·054	0·360
S.E.	5,907	0·83	515	0·96	11·5	0·91	1·609	0·82	34·3	0·80	0·047	0·272
S.S.E.	18,111	2·54	1506	2·75	12·0	0·95	4·414	2·25	117·8	2·76	0·037	0·243
S.	10,452	1·48	909	1·66	11·5	0·91	1·742	0·89	66·5	1·55	0·026	0·167
S.S.W.	8,059	1·09	587	1·07	13·7	1·09	1·815	0·92	41·2	0·97	0·044	0·225
S.W.	8,311	1·22	445	0·81	18·7	1·48	2·003	1·02	41·9	0·98	0·048	0·241
W.S.W.	6,982	0·98	417	0·76	16·7	1·32	2·099	1·07	41·2	0 97	0·051	0·300
W.	7,479	1·05	397	0·69	18·8	1·49	1·670	0·85	43·9	1·03	0·038	0·223
W.N.W.	14,541	2·03	763	1·39	19·1	1·51	3·264	1·66	71·3	1·68	0·046	0·224
N.W.	7,788	1·09	476	0·87	16·4	1·30	1·147	0·53	32·2	0·76	0·033	0 147
N.N.W.	8,702	1·24	629	1·15	13·8	1·10	2·984	1·52	33·6	0·79	0·089	0·342
N.	2,576	0·36	327	0·59	7·9	0·62	0·947	0·48	22·7	0·53	0 042	0·367
Columns...1	2	3	4	5	6	7	8	9	10	11	12	13
	114,276						31·539		683·5 = 28 days, 11 hours, 30 minutes.			

* There were nineteen calm hours in the year.

† There was one calm hour during which 0·054 of an inch of rain fell.

Mean quantity of rain to every 1000 miles of air, 0·276 in.
Mean quantity per hour during the time that rain fell, 0·461.

TABLE III. (*continued*). 1853.

Points of the Compass.	Whole amount of horizontal motion of the air.	Relative amount of horizontal motion of the air. (Mean = 1·00.)	Number of hours in which the direction of the wind was referred to each point.	Relative time the direction of the wind was referred to each point. (Mean = 1·00.)	Average hourly horizontal motion of the air from each point.	Relative hourly horizontal motion of the air. (Mean = 1·00.)	Whole fall of rain arranged according to the direction of the wind.	Relative fall of rain. (Mean = 1·00).	Whole time in hours during which rain fell.	Relative time during which rain fell. (Mean = 1·00.)	Average hourly rate at which rain fell.	Mean quantity of rain to every 1000 miles of air.
	Miles.		Hours.		Miles.		Inches.		Hours.		Inch.	Inch.
N.N.E.	4,303	0·65	655	1·26	6·6	0·55	1·700	1·21	40·1	1·20	0·042	0·392
N.E.	1,502	0·23	240	0·46	6·3	0·53	0·843	0·60	19·4	0·58	0·043	0·561
E.N.E.	2,773	0·42	360	0·69	7·7	0·65	0·836	0·59	19·4	0·58	0·043	0·301
E.	4,262	0·64	388	0·75	11·0	0·91	1·466	1·04	27·4	0·82	0·058	0·343
E.S.E.	3,832	0 58	404	0·76	9·5	0·80	0·954	0·68	19·4	0·58	0·049	0·248
S.E.	5,929	0·89	488	0·94	12·1	1·02	1·119	0·79	24·1	0·76	0·046	0·187
S.S.E.	14,316	2·15	1233	2·23	11·6	0·97	3·124	2·22	93·0	2·27	0·034	0·218
S.	6,358	0·95	646	1·25	9 8	0·82	1·479	1·05	47·5	1·46	0·031	0·217
S.S.W.	5,160	0·78	459	0·89	11·2	0·94	1·125	0·80	36·8	1·10	0·031	0·218
S.W.	7,572	1·14	432	0·83	17·5	1·47	1·262	0·81	34·8	1·05	0·036	0·166
W.S.W.	5,952	0·90	393	0·76	15·1	1·27	1·554	1·11	48·2	1·44	0·032	0·261
W.	6,938	1·04	395	0·76	17·6	1·48	2·085	1·48	42·8	1·28	0·049	0·300
W.N.W.	14,292	2·15	814	1·57	17·6	1·48	2·146	1·53	78·2	2·23	0·027	0·150
N.W.	9,678	1·45	662	1·28	14·9	1·25	1·091	0·78	47·5	1·42	0·023	0·102
N.N.W.	9,045	1·36	696	1·34	13·0	1·08	0·914	0·65	28·8	0·86	0·032	0·100
N.	4,077	0·63	468	0·90	8·7	0·72	0·777	0·55	20·8	0·62	0·037	0·190
Columns...1	2	3	4	5	6	7	8	9	10	11	12	13
	105,989						22·475		625·2 = 26 days 1 hour 12 minutes.			

There were twenty-seven calm hours.
Mean quantity of rain to every 1000 miles of air, 0·212 in.
Mean quantity per hour during the time that rain fell, 0·357.

Table III. (*continued*). 1854.

Points of the Compass.	Whole amount of horizontal motion of the air.	Relative amount of horizontal motion of the air. (Mean = 1·00.)	Number of hours in which the direction of the wind was referred to each point.	Relative time the direction of the wind was referred to each point. (Mean = 1·00.)	Average hourly horizontal motion of the air from each point.	Relative hourly horizontal motion of the air. (Mean = 1·00.)	Whole fall of rain arranged according to the direction of the wind.	Relative fall of rain. (Mean = 1·00.)	Whole time in hours during which rain fell.	Relative time during which rain fell. (Mean = 1·00.)	Average hourly rate at which rain fell.	Mean quantity of rain to every 1000 miles of air.
	Miles.		Hours.		Miles.		Inches.		Hours.		Inch.	Inch.
N.N.E.	2,604	0·33	373	0·68	6·5	0·50	1·061	0·78	18·2	0·54	0·058	0·407
N.E.	1,020	0·13	148	0·27	6·9	0 54	0·071	0·05	9·1	0·27	0·008	0·060
E.N.E.	1,481	0·19	199	0·36	7·1	0·55	0·361	0·26	13·8	0·41	0·026	0·243
E.	2,781	0·35	256	0·47	10·5	0·81	0·442	0·32	6·3	0·19	0·070	0·158
E.S.E.	3,046	0·38	309	0·56	9·2	0·76	0·760	0·51	13·1	0·39	0·053	0·229
S.E.	4,076	0·51	374	0·68	10 9	0·85	1·471	1·07	27·5	0·82	0·053	0·369
S.S.E.	12,317	1·53	1106	2·02	11·1	0·86	2·782	2·01	72·2	2·15	0·039	0·225
S.	7,196	0·90	673	1·23	10·7	0·83	1·436	1·04	41·8	1·24	0·034	0·190
S.S.W.	5,654	0·71	496	0·91	11·4	0·88	0·960	0·69	29·7	0·88	0·032	0·169
S.W.	6,486	0·81	411	0·75	15·8	1·21	0·989	0·72	22·3	0·66	0·044	0·152
W.S.W.	8,993	1·11	561	1·02	16·5	1·26	2·558	1·85	61·0	1·81	0·042	0·284
W.	14,331	1·77	666	1·22	21·5	1·66	2·689	1·94	64·7	1·92	0·042	0·187
W.N.W.	24,622	3·07	1210	2·21	20·3	1·58	2·689	1·94	68·9	2·05	0·039	0·109
N.W.	18,393	2·29	741	1·36	24·8	1·92	1·410	1·02	42·9	1·28	0·033	0·076
N.N.W.	11,666	1·45	820	1·50	14·2	1·10	1·922	1·39	30·0	0·89	0·064	0·164
N.	3,617	0·45	413	0·76	8·8	0·68	0·574	0·42	16·0	0·48	0·035	0·158
Columns...1	2	3	4	5	6	7	8	9	10	11	12	13
	128,283						22·115		537·5 = 22 days, 9 hours, 30 minutes.			

There were four calm hours in the year.
Mean quantity of rain to every 1000 miles of air, 0·172 in.
Mean quantity per hour during the time that rain fell, 0·411.

TABLE III.—Abstract of Results derived from the Integrating Anemometer and Rain-gauge arranged according to the direction of the wind. 1852. See Plates N and O.

Points of the Compass.	Whole amount of horizontal motion of the air.	Relative amount of horizontal motion of the air. (Mean = 1·00.)	Number of hours in which the direction of the wind was referred to each point.	Relative time the direction of the wind was referred to each point. (Mean = 1·00.)	Average hourly horizontal motion of the air from each point.	Relative hourly horizontal motion of the air. (Mean = 1·00.)	Whole fall of rain arranged according to the direction of the wind.	Relative fall of rain. (Mean = 1·00.)	Whole time in hours during which rain fell.	Relative time during which rain fell. (Mean = 1·00.)	Average hourly rate at which rain fell.	Mean quantity of rain to every 1000 miles of air.
	Miles.		Hours.		Miles.		Inches.		Hours.		Inch.	Inch.
N.N.E.	2,488	0·35	*426	0·78	5·8	0·48	†2·353	1·20	34·3	0·80	0·069	0·945
N.E.	1,239	0·17	198	0·36	6·3	0·50	1·158	0·59	20·0	0·47	0·058	0·934
E.N.E.	2,799	0·39	320	0·58	8·7	0·69	1·439	0·73	24·2	0·57	0·060	0·514
E.	4,708	0·66	427	0·78	11·0	0·89	1·408	0·72	30·9	0·72	0·046	0·299
E.S.E.	4,134	0·58	423	0·77	9·8	0·79	1·487	0·76	27·5	0·64	0·054	0·360
S.E.	5,907	0·83	515	0·96	11·5	0·91	1·609	0·82	34·3	0·80	0·047	0·272
S.S.E.	18,111	2·54	1506	2·75	12·0	0·95	4·414	2·25	117·8	2·76	0·037	0·243
S.	10,452	1·48	909	1·66	11·5	0·91	1·742	0·89	66·5	1·55	0·026	0·167
S.S.W.	8,059	1·09	587	1·07	13·7	1·09	1·815	0·92	41·2	0·97	0·044	0·225
S.W.	8,311	1·22	445	0·81	18·7	1·48	2·003	1·02	41·9	0·98	0·048	0·241
W.S.W.	6,982	0·98	417	0·76	16·7	1·32	2·099	1·07	41·2	0 97	0·051	0·300
W.	7,479	1·05	397	0·69	18·8	1·49	1·670	0·85	43·9	1·03	0·038	0·223
W.N.W.	14,541	2·03	763	1·39	19·1	1·51	3·264	1·66	71·3	1·68	0·046	0·224
N.W.	7,788	1·09	476	0·87	16·4	1·30	1·147	0·53	32·2	0·76	0·033	0 147
N.N.W.	8,702	1·24	629	1·15	13·8	1·10	2·984	1·52	33·6	0·79	0·089	0·342
N.	2,576	0·36	327	0·59	7·9	0·62	0·947	0·48	22·7	0·53	0 042	0·367
Columns...1	2	3	4	5	6	7	8	9	10	11	12	13
	114,276						31·539		683·5 = 28 days, 11 hours, 30 minutes.			

* There were nineteen calm hours in the year.

† There was one calm hour during which 0·054 of an inch of rain fell.

Mean quantity of rain to every 1000 miles of air, 0·276 in.
Mean quantity per hour during the time that rain fell, 0·461.

TABLE III. (*continued*). 1853.

Points of the Compass.	Whole amount of horizontal motion of the air.	Relative amount of horizontal motion of the air. (Mean = 1·00.)	Number of hours in which the direction of the wind was referred to each point.	Relative time the direction of the wind was referred to each point. (Mean = 1·00.)	Average hourly horizontal motion of the air from each point.	Relative hourly horizontal motion of the air. (Mean = 1·00.)	Whole fall of rain arranged according to the direction of the wind.	Relative fall of rain. (Mean = 1·00).	Whole time in hours during which rain fell.	Relative time during which rain fell. (Mean = 1·00.)	Average hourly rate at which rain fell.	Mean quantity of rain to every 1000 miles of air.
	Miles.		Hours.		Miles.		Inches.		Hours.		Inch.	Inch.
N.N.E.	4,303	0·65	655	1·26	6·6	0·55	1·700	1·21	40·1	1·20	0·042	0·392
N.E.	1,502	0·23	240	0·46	6·3	0·53	0·843	0·60	19·4	0·58	0·043	0·561
E.N.E.	2,773	0·42	360	0·69	7·7	0·65	0·836	0·59	19·4	0·58	0·043	0·301
E.	4,262	0·64	388	0·75	11·0	0·91	1·466	1·04	27·4	0·82	0·058	0·343
E.S.E.	3,832	0 58	404	0·76	9·5	0·80	0·954	0·68	19·4	0·58	0·049	0·248
S.E.	5,929	0·89	488	0·94	12·1	1·02	1·119	0·79	24·1	0·76	0·046	0·187
S.S.E.	14,316	2·15	1233	2·23	11·6	0·97	3·124	2·22	93·0	2·27	0·034	0·218
S.	6,358	0·95	646	1·25	9·8	0·82	1·479	1·05	47·5	1·46	0·031	0·217
S.S.W.	5,160	0·78	459	0·89	11·2	0·94	1·125	0·80	36·8	1·10	0·031	0·218
S.W.	7,572	1·14	432	0·83	17·5	1·47	1·262	0·81	34·8	1·05	0·036	0·166
W.S.W.	5,952	0·90	393	0·76	15·1	1·27	1·554	1·11	48·2	1·44	0·032	0·261
W.	6,938	1·04	395	0·76	17·6	1·48	2·085	1·48	42·8	1·28	0·049	0·300
W.N.W.	14,292	2·15	814	1·57	17·6	1·48	2·146	1·53	78·2	2·23	0·027	0·150
N.W.	9,678	1·45	662	1·28	14·9	1·25	1·091	0·78	47·5	1·42	0·023	0·102
N.N.W.	9,045	1·36	696	1·34	13·0	1·08	0·914	0·65	28·8	0·86	0·032	0·100
N.	4,077	0·63	468	0·90	8·7	0·72	0·777	0·55	20·8	0·62	0·037	0·190
Columns...1	2	3	4	5	6	7	8	9	10	11	12	13
	105,989						22·475		625·2 = 26 days 1 hour 12 minutes.			

There were twenty-seven calm hours.
Mean quantity of rain to every 1000 miles of air, 0·212 in.
Mean quantity per hour during the time that rain fell, 0·357.

Table III. (*continued*). 1854.

Points of the Compass.	Whole amount of horizontal motion of the air.	Relative amount of horizontal motion of the air. (Mean = 1·00.)	Number of hours in which the direction of the wind was referred to each point.	Relative time the direction of the wind was referred to each point. (Mean = 1·00.)	Average hourly horizontal motion of the air from each point.	Relative hourly horizontal motion of the air. (Mean = 1·00.)	Whole fall of rain arranged according to the direction of the wind.	Relative fall of rain. (Mean = 1·00.)	Whole time in hours during which rain fell.	Relative time during which rain fell. (Mean = 1·00.)	Average hourly rate at which rain fell.	Mean quantity of rain to every 1000 miles of air.
	Miles.		Hours.		Miles.		Inches.		Hours.		Inch.	Inch.
N.N.E.	2,604	0·33	373	0·68	6·5	0·50	1·061	0·78	18·2	0·54	0·058	0·407
N.E.	1,020	0·13	148	0·27	6·9	0 54	0·071	0·05	9·1	0·27	0·008	0·060
E.N.E.	1,481	0·19	199	0·36	7·1	0·55	0·361	0·26	13·8	0·41	0·026	0·243
E.	2,781	0·35	256	0·47	10·5	0·81	0·442	0·32	6·3	0·19	0·070	0·158
E.S.E.	3,046	0·38	309	0·56	9·2	0·76	0·700	0·51	13·1	0·39	0·053	0·229
S.E.	4,076	0·51	374	0·68	10 9	0·85	1·471	1·07	27·5	0·82	0·053	0·369
S.S.E.	12,317	1·53	1106	2·02	11·1	0·86	2·782	2·01	72·2	2·15	0·039	0·225
S.	7,196	0·90	673	1·23	10·7	0·83	1·436	1·04	41·8	1·24	0·034	0·190
S.S.W.	5,654	0·71	496	0·91	11·4	0·88	0·960	0·69	29·7	0·88	0·032	0·169
S.W.	6,486	0·81	411	0·75	15·8	1·21	0·989	0·72	22·3	0·66	0·044	0·152
W.S.W.	8,993	1·11	561	1·02	16·5	1·26	2·558	1·85	61·0	1·81	0·042	0·284
W.	14,331	1·77	666	1·22	21·5	1·66	2·689	1·94	64·7	1·92	0·042	0·187
W.N.W.	24,622	3·07	1210	2·21	20·3	1·58	2·689	1·94	68·9	2·05	0·039	0·109
N.W.	18,393	2·29	741	1·36	24·8	1·92	1·410	1·02	42·9	1·28	0·033	0·076
N.N.W.	11,666	1·45	820	1·50	14·2	1·10	1·922	1·39	30·0	0·89	0·064	0·164
N.	3,617	0·45	413	0·76	8·8	0·68	0·574	0·42	16·0	0·48	0·035	0·158
Columns...1	2	3	4	5	6	7	8	9	10	11	12	13
	128,283						22·115		537·5 = 22 days, 9 hours, 30 minutes.			

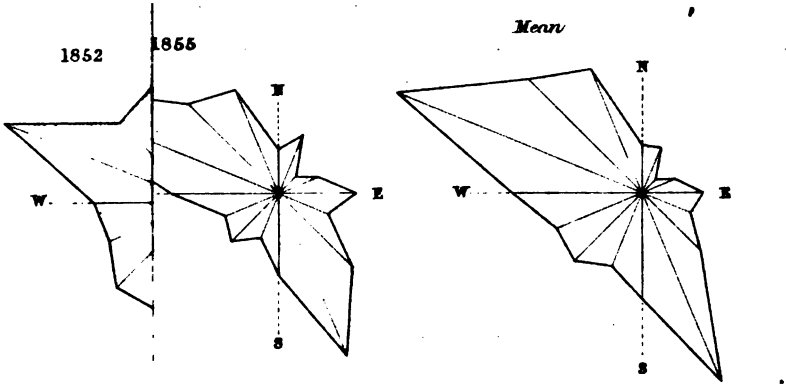
There were four calm hours in the year.
Mean quantity of rain to every 1000 miles of air, 0·172 in.
Mean quantity per hour during the time that rain fell, 0·411.

TABLE III. (*continued*). 1855.

Points of the Compass.	Whole amount of horizontal motion of the air.	Relative amount of horizontal motion of the air. (Mean = 1·00.)	Number of hours in which the direction of the wind was referred to each point.	Relative time the direction of the wind was referred to each point. (Mean = 1·00.)	Average hourly horizontal motion of the air from each point.	Relative hourly horizontal motion of the air. (Mean = 1·00.)	Whole fall of rain arranged according to the direction of the wind.	Relative fall of rain. (Mean = 1·00.)	Whole time in hours during which rain fell.	Relative time during which rain fell. (Mean = 1·00.)	Average hourly rate at which rain fell.	Mean quantity of rain to every 1000 miles of air.
	Miles.		Hours.		Miles.		Inches.		Hours.		Inch.	Inch.
N.N.E.	4,456	0·67	703	1·28	6·4	0·56	0·973	0·69	34·9	1·03	0·028	0·218
N.E.	1,727	0·26	264	0·48	7·3	0·64	0·233	0·17	9·2	0·27	0·025	0·134
E.N.E.	3,014	0·46	383	0·70	7·9	0·69	0·702	0·49	14·5	0·43	0·048	0·232
E.	5,418	0·84	460	0·84	11·8	1·04	0·182	0·13	4·0	0·12	0·046	0·033
E.S.E.	3,807	0·59	401	0·73	9·4	0·83	0·599	0·42	10·8	0·32	0·056	0·157
S.E.	7,229	1·10	556	1·02	11·2	0·99	1·146	0·81	30·7	0·91	0·037	0·158
S.S.E.	12,267	1·90	1132	2·07	10·8	0·95	3·129	2·20	118·0	3·50	0·027	0·255
S.	5,728	0·88	614	1·12	9·3	0·82	1·860	1·31	45·8	1·35	0 041	0·324
S.S.W.	3,322	0·52	302	0 55	11·0	0·97	0·352	0·24	12·6	0·37	0 028	0·105
S.W.	4,742	0·73	312	0·57	15·0	1·32	1·486	1·05	18·8	0 56	0·071	0·313
W.S.W.	4,014	0·62	309	0·56	13·0	1·15	0·262	0·18	20·0	0·59	0·013	0·065
W.	7,439	1·15	413	0·76	18·0	1·59	3·912	2·77	52·2	1·55	0·075	0·525
W.N.W.	20,353	3·15	1046	1·91	19·5	1·72	2·744	1·94	64·5	1·91	0·043	0·134
N.W.	8,857	1·36	630	1·15	14·1	1·14	2·722	1·91	44·9	1·30	0·060	0·307
N.N.W.	7,883	1·22	782	1·43	10·1	0·89	0·826	0·58	25·7	0·76	0·032	0·104
N.	3,149	0·49	441	0·81	7·1	0·63	1·440	1·02	33·2	0·98	0·043	0·457
Columns...1	2	3	4	5	6	7	8	9	10	11	12	13
	103,405						22·568		539·8 = 22 days 11 hours 48 minutes.			

There were twelve calm hours.
Mean quantity of rain to every 1000 miles of air, 0·218 in.
Mean quantity per hour during the time that rain fell, 0·418.

Column 2.



See Table III. Column 4.

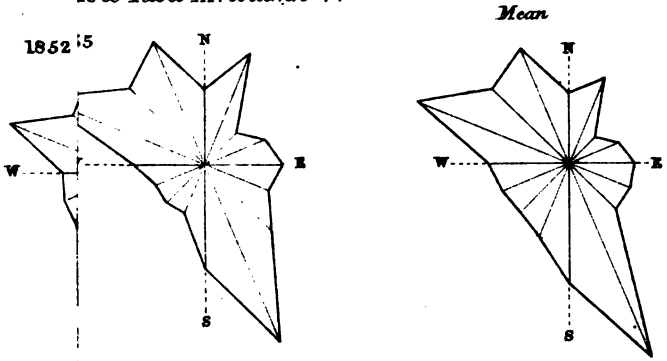


Table III. Column 6.

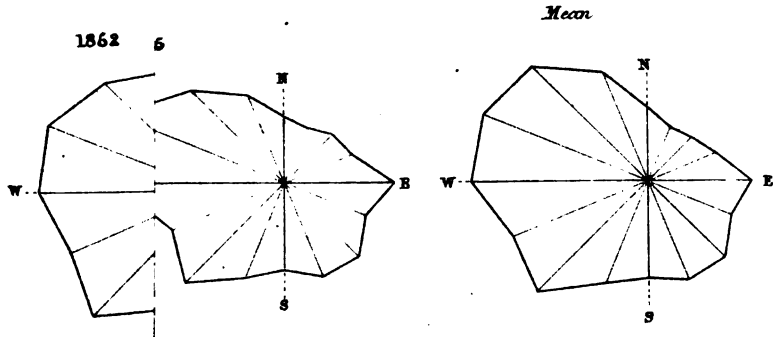


TABLE III. (*continued*). Means for the years 1852, 1853, 1854, and 1855.

Points of the Compass.	Whole amount of horizontal motion of the air.	Relative amount of horizontal motion of the air. (Mean = 1·00.)	Number of hours in which the direction of the wind was referred to each point.	Relative time the direction of the wind was referred to each point. (Mean = 1·00.)	Average hourly horizontal motion of the air from each point.	Relative hourly horizontal motion of the air. (Mean = 1·00.)	Whole fall of rain arranged according to the direction of the wind.	Relative fall of rain. (Mean = 1·00.)	Whole time in hours during which rain fell.	Relative time during which rain fell. (Mean = 1·00.)	Average hourly rate at which rain fell.	Mean quantity of rain to every 1000 miles of air.
	Miles.		Hours.		Miles.		Inches.		Hours.		Inch.	Inch.
N.N.E.	3,463	0·49	539	0·98	6·20	0·49	1·522	0·99	31·9	0·86	0·049	0·440
N.E.	1,372	0·19	213	0·39	6·60	0·51	0·576	0·37	14·4	0 39	0·033	0·420
E.N.E.	2,517	0 36	315	0·58	7·80	0·60	0·834	0·55	18·0	0·49	0·044	0·331
E.	4,292	0·61	383	0·70	11·00	0·85	0·874	0·56	17·1	0·46	0·055	0·203
E.S.E.	3,705	0·52	384	0·70	9·60	0·74	0·935	0·60	17·7	0·48	0·053	0·252
S.E.	5,785	0·82	483	0·88	11·60	0 90	1·334	0·86	29·1	0·79	0·046	0·231
S.S.E.	14,253	2·02	1244	2·28	11·40	0·88	3·362	2·18	100·2	2·71	0·034	0 236
S.	7,433	1·05	711	1·30	10 30	0·80	1·629	1·05	50·4	1·36	0·033	0·219
S.S.W.	5,549	0·79	461	0·84	11·80	0·91	1·063	0·69	30·1	0 81	0·034	0·192
S.W.	6,778	0·96	400	0·73	16·70	1·30	1·435	0·93	29·4	0·80	0·050	0·212
W.S.W.	6,485	0·92	420	0·77	15·50	1·20	1·518	0·98	42·6	1·15	0·036	0·234
W.	9,047	1·28	468	0·85	18·90	1·46	2·589	1·68	50·9	1·37	0·051	0·286
W.N.W.	18,452	2·61	958	1·75	19·00	1·47	2·711	1·76	79·7	1·91	0·039	0·141
N.W.	11,179	1·58	627	1·15	17·40	1·35	1·592	1·03	41·9	1·13	0·037	0·142
N.N.W.	9,324	1·32	732	1·34	12·70	0·98	1·661	1·07	29·5	0·80	0·054	0·177
N.	3,355	0·48	412	0·75	7·80	0·60	0·934	0·60	23·2	0·63	0·039	0·278
Columns...1	2	3	4	5	6	7	8	9	10	11	12	13
	112,989						24·671		597·1 = 24 days 21 hours 6 minutes.			

TABLE IV.—Abstracts of Results from the Integrating Anemometer and the Pluviometer during the years 1852, 1853, 1854, and 1855, arranged according to the hours of the day. 1852.

Hours of the day.	Mean horizontal motion of the air in miles for each hour of the day.	Relative horizontal motion of the air for each hour. (Mean = 1·00.)	Whole amount of rain which fell between the hours named in the side column.	Relative fall of rain for each hour of the day. (Mean = 1·00.)	Whole time in hours during which rain fell.	Relative time during which rain fell. (Mean = 1·00.)	Average hourly rate at which rain fell for each hour of the day.
Columns.....1	2	3	4	5	6	7	8
h h	Miles.		Inches.		Hours.		Inch.
12 to 1 A.M.	11·2	0·86	1·269	0·97	30·2	1·06	0·042
1 „ 2	11·4	0·88	1·242	0·95	26·2	0·92	0·048
2 „ 3	11·4	0·88	1·529	1·08	34·3	1·20	0·042
3 „ 4	11·5	0·88	1·353	1·03	35·0	1·23	0·038
4 „ 5	12·0	0·92	1·160	0·88	24·0	0·84	0·048
5 „ 6	12·0	0·92	1·386	1·06	30·2	1·06	0·046
6 „ 7	12·2	0·94	1·398	1·07	28·2	0·99	0·050
7 „ 8	12·7	0·98	1·555	1·19	28·8	1·01	0·054
8 „ 9	13·4	1·03	1·459	1·11	31·6	1·11	0·046
9 „ 10	13·7	1·05	1·090	0·83	28·8	1·01	0·038
10 „ 11	14·4	1·11	1·389	1·07	27·5	0·97	0·050
11 „ 12	15·1	1·16	0·936	0·71	26·8	0·94	0·035
12 „ 1 P.M.	15·2	1·17	1·305	0·99	25·4	0·89	0·051
1 „ 2	15·5	1·19	1·178	0·89	26·7	0·94	0·044
2 „ 3	15·2	1·17	1·359	1·04	26·1	0·92	0·051
3 „ 4	14·9	1·14	1·476	1·13	26·7	0·94	0·055
4 „ 5	14·5	1·11	1·241	0·95	35·6	1·25	0·035
5 „ 6	13·6	1·04	1·262	0·96	26·7	0·94	0·047
6 „ 7	13·1	1·01	1·354	1·03	30·9	1·08	0·044
7 „ 8	12·7	0·98	0·851	0·64	21·9	0·77	0·039
8 „ 9	12·2	0·94	1·594	1·21	28·9	1·01	0·055
9 „ 10	11·6	0·89	1·306	1·00	24·0	0·84	0·054
10 „ 11	11·5	0·88	1·356	1·03	29·5	1·04	0·046
11 „ 12	11·5	0·88	1·545	1·18	29·5	1·04	0·052
			1853.				
12 to 1 A.M.	10·3	0·85	0·607	0·68	16·1	0·69	0·037
1 „ 2	10·5	0·87	0·833	0·93	21·4	0·91	0·039
2 „ 3	10·7	0·88	0·607	0·68	21·4	0·91	0·026
3 „ 4	10·5	0·87	0·766	0·85	26·1	1·12	0·029
4 „ 5	10·8	0·89	1·049	1·17	30·2	1·29	0·035
5 „ 6	10·8	0·89	0·915	1·02	27·5	1·18	0·034
6 „ 7	11·3	0·93	1·089	1·21	30·8	1·32	0·035
7 „ 8	12·0	0·99	1·249	1·38	30·8	1·32	0·040
8 „ 9	12·5	1·03	1·046	1·17	32·8	1·40	0·032
9 „ 10	13·2	1·09	1·185	1·34	30·1	1·29	0·039
10 „ 11	13·8	1·14	1·577	1·76	30·1	1·29	0·052
11 „ 12	14·2	1·17	0·860	0·96	22·1	0·94	0·039
12 „ 1 P.M.	14·5	1·20	1·011	1·13	27·5	1·14	0·037
1 „ 2	14·7	1·21	1·173	1·31	28·8	1·24	0·041
2 „ 3	14·4	1·19	0·818	0·91	25·5	1·04	0·032
3 „ 4	14·0	1·16	0·811	0·90	26·1	1·12	0·031
4 „ 5	13·5	1·12	1·047	1·17	31·5	1·35	0·033
5 „ 6	12·7	1·05	0·920	1·03	30·8	1·32	0·030
6 „ 7	11·7	0·97	1·108	1·24	30·1	1·29	0·037
7 „ 8	11·2	0·93	0·788	0·88	28·1	1·20	0·028
8 „ 9	11·0	0·91	0·913	1·02	21·4	0·91	0·042
9 „ 10	10·9	0·90	0·681	0·76	20·1	0·86	0·034
10 „ 11	10·5	0·87	0·631	0·70	18·1	0·78	0·035
11 „ 12	10·6	0·88	0·820	0·91	21·4	0·91	0·038

TABLE IV. (*continued*). 1854.

Hours of the day. Columns.....1	Mean horizontal motion of the air in miles for each hour of the day. 2	Relative horizontal motion of the air for each hour. (Mean = 1·00.) 3	Whole amount of rain which fell between the hours named in the side column. 4	Relative fall of rain for each hour of the day. (Mean = 1·00.) 5	Whole time in hours during which rain fell. 6	Relative time during which rain fell. (Mean = 1·00.) 7	Average hourly rate at which rain fell for each hour of the day. 8
h h	Miles.		Inches.		Hours.		Inch.
12 to 1 A.M.	12·8	0·90	0·762	0·83	18·2	0·77	0·042
1 „ 2	12·8	0·90	0·415	0 45	20·4	0·92	0·020
2 „ 3	12·8	0·90	0·556	0·60	18·7	0·78	0·030
3 „ 4	13·1	0·92	1·031	1·12	28·6	1·26	0·036
4 „ 5	12·6	0·89	1·289	1·40	31·8	1·42	0·041
5 „ 6	12·6	0 89	1·247	1·35	26·0	1·16	0·048
6 „ 7	12·8	0·90	1·263	1·37	27·3	1·22	0 046
7 „ 8	13·6	0·96	1·112	1·21	26·2	1·18	0·043
8 „ 9	14·0	0·99	0 593	0·63	20·2	0·90	0·029
9 „ 10	14·9	1·05	0·881	0·96	20·2	0·90	0·043
10 „ 11	15·2	1·07	0·706	0·76	21·8	0·97	0·032
11 „ 12	15·5	1·09	0·936	1·01	26·3	1·17	0·036
12 „ 1 P.M.	16·3	1·15	0·820	0·89	20·1	0·90	0·039
1 „ 2	16·6	1·17	1·026	1·11	20·0	0·90	0·051
2 „ 3	16·3	1·15	0·714	0·78	17·4	0·78	0·041
3 „ 4	16·0	1·13	0·776	0·84	16·9	0·75	0·046
4 „ 5	15·6	1·10	1·090	1:18	20·9	0·93	0·052
5 „ 6	14·9	1·05	0·733	0·79	19·1	0·85	0·038
6 „ 7	14·5	1·02	0·836	0·91	26·6	1·19	0·031
7 „ 8	14·0	0·99	1·052	1·14	25·4	1·13	0·041
8 „ 9	13·5	0·96	1·518	1·64	21·8	0·97	0·069
9 „ 10	13·3	0·94	1·065	1·16	19·6	0·87	0·054
10 „ 11	13·3	0·94	0·734	0·80	22·8	1·01	0·033
11 „ 12	13·1	0·92	0·860	0·93	21 2	0·94	0·041
			1855.				
12 to 1 A.M.	10·5	0·89	0·657	0·69	22·2	0·99	0·029
1 „ 2	10·5	0·89	0·971	1·03	24·6	1·09	0 039
2 „ 3	10·3	0 87	0·771	0·82	21·4	0·95	0·036
3 „ 4	10·4	0·87	0·827	0·88	25·1	1·11	0·033
4 „ 5	10·4	0·87	0·827	0·88	26·5	1·18	0·031
5 „ 6	10·5	0·89	0·648	0·68	20·3	0·90	0·032
6 „ 7	10·8	0·91	0·795	0·84	22·9	1·01	0·035
7 „ 8	11·5	0·97	0·856	0·91	24·3	1·08	0·035
8 „ 9	11·6	0·97	0·666	0·71	25·3	1·12	0·027
9 „ 10	12·3	1·04	0·880	0·93	26·0	1·16	0·034
10 „ 11	13·1	1·11	0·768	0·81	20·2	0 90	0 038
11 „ 12	13·5	1·14	1·121	1·19	25·4	1·12	0·044
12 „ 1 P.M.	13·9	1·18	1·445	1·53	23·3	1·03	0·062
1 „ 2	14·2	1·20	1·756	1·86	19·7	0·87	0·081
2 „ 3	14·0	1·18	0·933	0·98	15·0	0·66	0·062
3 „ 4	13·5	1·14	0·778	0·83	23·0	1·02	0·034
4 „ 5	13·0	1·11	0·887	0·94	19·9	0·88	0·044
5 „ 6	12·6	1·06	1·608	1·69	20·6	0·91	0·078
6 „ 7	11·6	0·97	1·025	1·08	19·8	0·88	0·052
7 „ 8	11·2	0·95	0·916	0·96	24·7	1·09	0·037
8 „ 9	10·8	0·91	0·971	1·03	19·9	0·88	0·049
9 „ 10	10·8	0·91	0 653	0·68	22·8	1·01	0·029
10 „ 11	10·7	0·91	0·709	0·75	25·1	1·11	0·028
11 „ 12	10·6	0·89	1·100	1·17	21·8	0·97	0·050

Table IV. (*continued*).—Means for the years 1852, 1853, 1854, and 1855.

Hours of the day.	Mean horizontal motion of the air in miles for each hour of the day.	Relative horizontal motion of the air for each hour. (Mean = 1·00.)	Whole amount of rain which fell between the hours named in the side column.	Relative fall of rain for each hour of the day. (Mean = 1·00.)	Whole time in hours during which rain fell.	Relative time during which rain fell. (Mean = 1·00.)	Average hourly rate at which rain fell for each hour of the day.
Columns.....1	2	3	4	5	6	7	8
h h	Miles.		Inches.		Hours.		Inch.
12 to 1 A.M.	11·2	0·88	0·824	0·80	21·7	0·87	0·037
1 „ 2	11·3	0·89	0·865	0·84	23·1	0·93	0·036
2 „ 3	11·3	0·89	0·866	0·84	23·9	0·96	0·033
3 „ 4	11·4	0·90	0·994	0·96	28·7	1·14	0·034
4 „ 5	11·4	9·90	1·081	1·05	28·1	1·13	0·039
5 „ 6	11·5	0·90	1·049	1·02	26·0	1·05	0·040
6 „ 7	11·8	0·93	1·136	1·10	27·3	1·10	0·041
7 „ 8	12·4	0·97	1·193	1·16	27·5	1·10	0·043
8 „ 9	12·9	1·01	0·941	0·91	27·5	1·10	0·033
9 „ 10	13·5	1·06	1·009	0·97	26·3	1·06	0·036
10 „ 11	14·1	1·11	1·110	1·08	24·9	1·00	0·043
11 „ 12	14·6	1·15	0·963	0·93	25·1	1·01	0·038
12 „ 1 P.M.	15·0	1·18	1·145	1 11	24·1	1·00	0 047
1 „ 2	15·2	1·19	1·283	1·25	23·8	0·96	0·054
2 „ 3	15·0	1·18	0·956	0·93	21 0	0·84	0 046
3 „ 4	14·6	1·15	0·960	0·93	23·2	0 93	0·041
4 „ 5	14·1	1·11	1·066	1·03	27·0	1·09	0·041
5 „ 6	13·4	1·05	1·131	1·10	24·3	1·00	0·048
6 „ 7	12·7	1·00	1·081	1·05	26·8	1·09	0·041
7 „ 8	12·3	0·97	0·902	0·90	25·0	1·01	0·036
8 „ 9	11·9	0·93	1·249	1·21	23·0	0·93	0·054
9 „ 10	11·6	0·91	0·926	0·90	21·6	0 87	0·043
10 „ 11	11·5	0·90	0·857	0·83	23·9	0·96	0·035
11 „ 12	11·4	0·90	1·081	1·05	23·5	0·94	0·045

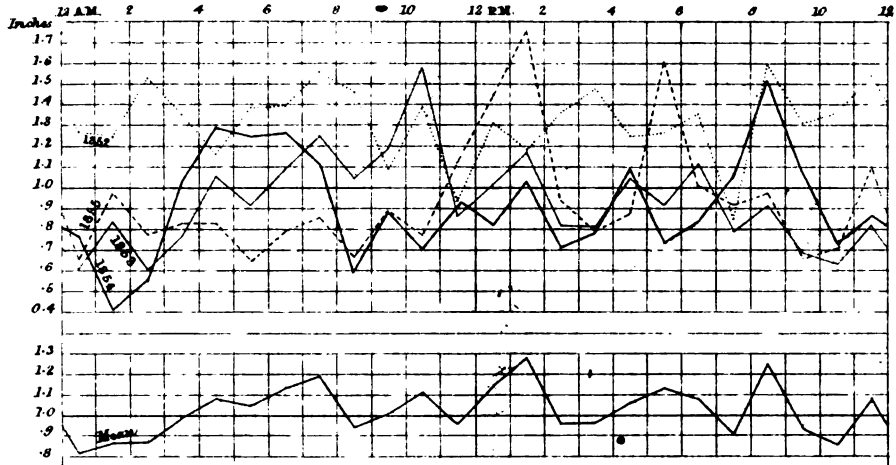
TABLE V.—Whole amount of rain that fell between each hour. See Plate P fig. 1, and Table IV. col. 4.

A.M.	12 to 1.	1 to 2.	2 to 3.	3 to 4.	4 to 5.	5 to 6.	6 to 7.	7 to 8.	8 to 9.	9 to 10.	10 to 11	11 to 12
1852.	1·269	1·242	1·529	1·353	1·160	1·386	1·398	1·555	1·459	1·090	1·389	0·936
1853.	0·607	0·833	0·607	0·766	1·049	0·915	1·089	1·249	1·046	1·185	1·577	0·860
1854.	0·762	0·415	0·556	1·031	1·289	1·247	1·263	1·112	0 593	0·881	0·706	0·936
1855.	0·657	0·971	0·771	0·827	0·827	0·648	0·795	0·856	0·666	0·880	0·768	1·121
Mean	0·824	0·865	0·866	0·994	1·081	1·049	1·136	1·193	0·941	1·009	1·110	0·963

P.M.	12 to 1.	1 to 2.	2 to 3.	3 to 4.	4 to 5.	5 to 6.	6 to 7.	7 to 8.	8 to 9.	9 to 10.	10 to 11	11 to 12
1852.	1·305	1·178	1·359	1·476	1·241	1·262	1·354	0·851	1·594	1·306	1·356	1·545
1853.	1·011	1·173	0·818	0·811	1 047	0·920	1·108	0·788	0·913	0·681	0·631	0·820
1854.	0·820	1·026	0·714	0·776	1·090	0·733	0·836	1·052	1·518	1·065	0·734	0·860
1855.	1·445	1·756	0·933	0·778	0·887	1·608	1·025	0·916	0·971	0·653	0·709	1·100
Mean	1·145	1·283	0·956	0 960	1·066	1·131	1·081	0·902	1·249	0·926	0 857	1·081

Fig. 1.

Whole Amount of Rain that fell between each hour of the day in 1852_3_4_5 See table V.



Mean quantity of RAIN to every 1000 miles of Air from each of the 16 points of the compass for the years 1852 3 4 & 5.

Fig. 2.

See table III Column 13

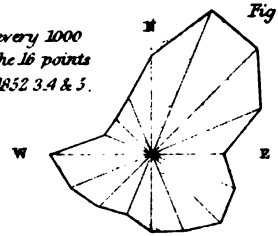


Fig. 3.

Mean hourly horizontal motion of the AIR in miles for each month in 1852_3_4_5 (See table VI.)

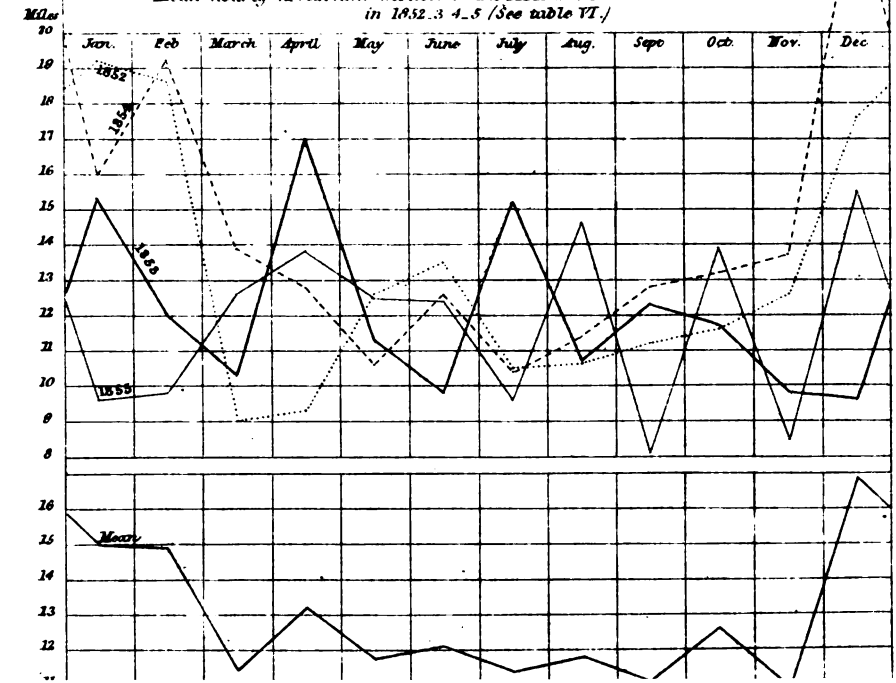
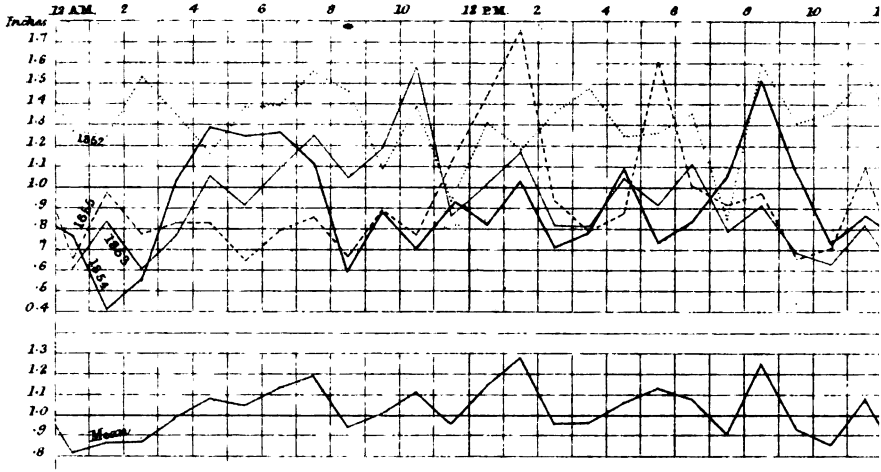


Fig 1. Plat

Whole Amount of Rain that fell between each hour of the day in 1852.3.4.5 See table V.



Mean quantity of RAIN to every 1000 miles of Air from each of the 16 points of the Compass for the years 1852.3.4 & 5.

Fig. 2.

See table III Column 13

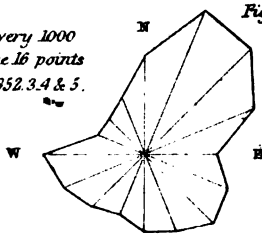
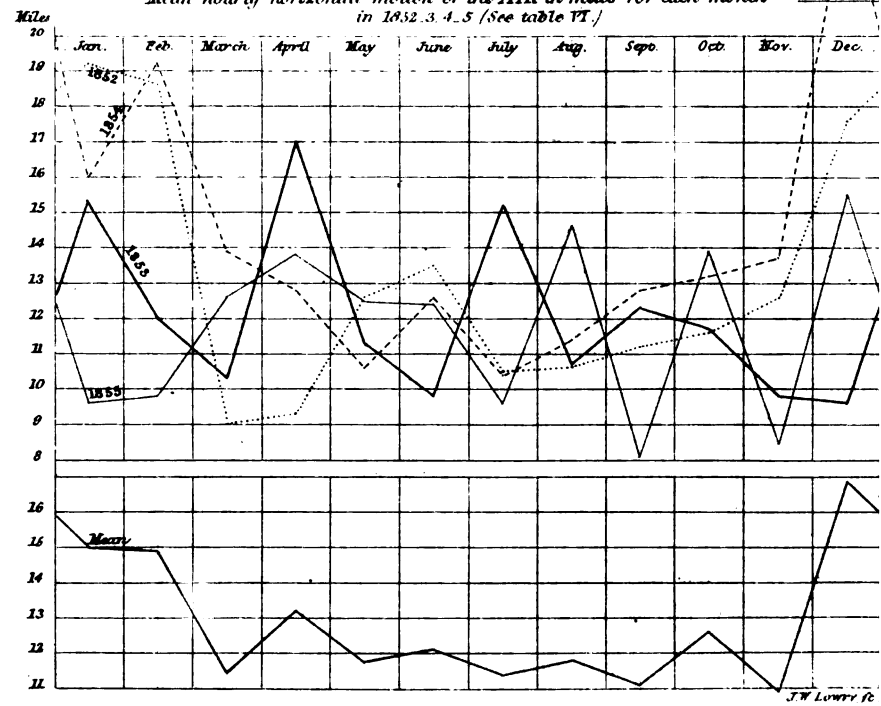


Fig. 3.

Mean hourly horizontal motion of the AIR in miles for each month in 1852.3.4.5 (See table VI.)



J.W. Lowry fc

TABLE VI.—Mean hourly horizontal motion of the air in miles for each month. See Plate P. fig. 3.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1852.	19·2	18·6	9·0	9·3	12·6	13·5	10·5	10·6	11·2	11·6	12·6	17·6
1853.	15·3	12·0	10·3	17·0	11·3	9·8	15·2	10·7	12·3	11·7	9·8	9·6
1854.	16·0	19·2	13·9	12·8	10·6	12·6	10·4	11·4	12·8	13·2	13·7	23·9
1855.	9·6	9·8	12·6	13·8	12·5	12·4	9·6	14·6	8·1	13·9	8·5	15·5
Mean	15·0	14·9	11·45	13·2	11·75	12·1	11·4	11·8	11·1	12·6	10·9	16·65

Winter. Dec., Jan., Feb.	Spring. Mar., Apr., May.	Summer. June, July, Aug.	Autumn. Sept., Oct., Nov.
15·6 miles per hour.	12·1 miles per hour.	11·8 miles per hour.	11·5 miles per hour.

TABLE VII.—Horizontal motion of the air for the years 1852, 1853, 1854, and 1855.

	Miles.	Hours.	Calm hours.	Total number of hours in the year.	Mean rate per hour per annum.
1852.*	114,276	8765	19	8784	13·00
1853.	105,989	8733	27	8760	12·09
1854.	128,283	8756	4	8760	14·64
1855.	103,405	8748	12	8760	11·80
Mean	112,989	8750	15·5	8766	12·90

* Leap year.

The sums of all the changes in the direction of the wind are in the following order :—

N.E.S.W.N. { 28 revolutions in 1852. 24 revolutions in 1853. 26 revolutions in 1854. 24 revolutions in 1855.

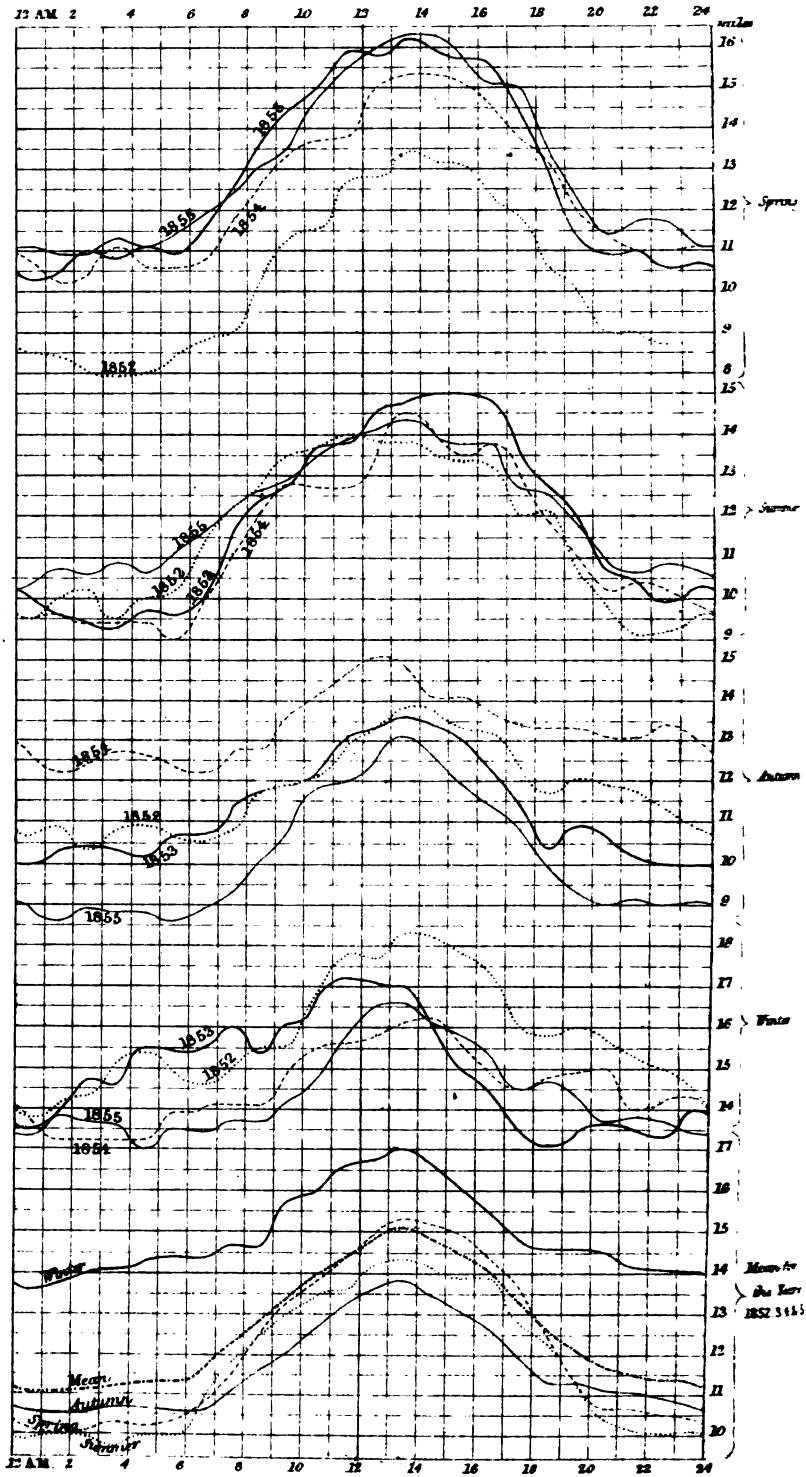
N.W.S.E.N. { 12 revolutions in 1852. 12 revolutions in 1853. 2 revolutions in 1854. 10 revolutions in 1855.

The excess of the direct over the retrograde motion was therefore—
in 1852, Sixteen revolutions,
in 1853, Twelve revolutions,
in 1854, Twenty-four revolutions,
in 1855, Fourteen revolutions.

The following Table exhibits the extreme pressure of the wind in pounds on the square foot, and the greatest horizontal motion of the air between any one hour and the next hour following, for all the gales during the four years in which the pressure has reached fifteen pounds on the square foot.

Date.	Extreme pressure on the square foot.	Time at which it occurred.	Greatest velocity of the air between any one hour and the next hour following.	Hours between which it occurred.	Direction of the wind.
1852.	Pounds.	h m	Miles.	h h	
January 3	16	7 30 P.M.	50	8 & 9 P.M.	S.W.
,, 4	28	5 30 A.M.	53	5 ,, 6 A.M.	W.N.W.
,, 7	19	2 30 P.M.	50	3 ,, 4 P.M.	W.N.W.
,, 8	18	4 12 P.M.	39	4 ,, 5 P.M.	S.
,, 9	29	3 0 A.M.	62	4 ,, 5 A.M.	W.N.W.
,, 15	16	11 30 A.M.	44	11 ,, 12 A.M.	W.
,, 16	15	0 45 P.M.	40	12 ,, 1 P.M.	W.
,, 21	18	7 30 P.M.	46	8 ,, 9 P.M.	W.S.W.
,, 25	16	4 30 P.M.	27	4 ,, 5 P.M.	S.S.W.
,, 30	17	0 20 P.M.	38	12 ,, 1 P.M.	W.N.W.
February 6	15	4 45 A.M.	44	4 ,, 5 A.M.	W.N.W.
,, 9	18	4 20 A.M.	47	5 ,, 6 A.M.	N.N.W.
,, 16	22	7 42 P.M.	50	7 ,, 8 P.M.	W.N.W.
,, 17	16	7 38 P.M.	47	8 ,, 9 P.M.	W.
,, 18	15	8 30 A.M.	47	6 ,, 7 A.M.	N.W.
May 14	17	9 30 A.M.	49	9 ,, 10 A.M.	W.N.W.
December 25	42	4 45 A.M.	70	4 ,, 5 A.M.	W.S.W.
,, 27	42	6 48 A.M.	71	8 ,, 9 A.M.	S.W.
1853.					
January 6	19	10 40 A.M.	38	6 ,, 7 P.M.	W.N.W.
,, 11	17	10 12 A.M.	47	10 ,, 11 A.M.	W.
,, 12	17	7 50 A.M.	47	9 ,, 10 A.M.	S.W.
February 26	33	11 40 A.M.	60	12 ,, 1 P.M.	N.N.W.
April 1	23	11 0 A.M.	51	12 ,, 1 P.M.	S.W.
,, 7	16	2 30 P.M.	42	2 ,, 3 P.M.	W.N.W.
September 25	37	7 50 P.M.	65	7 ,, 8 P.M.	N.N.W.
,, 26	24	2 12 A.M.	56	2 ,, 3 A.M.	N.N.W.
1854.					
January 20	22	0 42 P.M.	30	9 ,, 10 P.M.	W.S.W.
,, 24	19	2 54 A.M.	34	5 ,, 6 A.M.	S.
,, 25	16	3 36 P.M.	34	7 ,, 8 P.M.	W.S.W.
,, 26	43	10 42 A.M.	53	9 ,, 10 A.M.	W.
,, 27	20	7 24 P.M.	53	7 ,, 8 P.M.	S.W.
February 6	15	0 36 A.M.	43	1 ,, 2 A.M.	W.
,, 8	21	1 6 A.M.	45	1 ,, 2 A.M.	W.N.W.
,, 15	15	4 24 A.M.	40	5 ,, 6 A.M.	N.W.
,, 17	27	8 6 P.M.	56	8 ,, 9 P.M.	N.W.
,, 18	31	3 54 A.M.	56	4 ,, 5 A.M.	W.N.W.
,, 22	18	2 18 P.M.	35	3 ,, 4 P.M.	S.S.W.
October 22	24	6 42 A.M.	44	6 ,, 7 A.M.	N.W.
December 2	16	5 6 A.M.	47	6 ,, 7 A.M.	W.N.W.
,, 3	25	3 54 P.M.	45	11 ,, 12 P.M.	W.N.W.
,, 4	17	1 6 A.M.	43	0 ,, 1 A.M.	W.N.W.
,, 5	16	11 18 A.M.	45	8 ,, 9 P.M.	W.
,, 15	17	8 42 A.M.	44	8 ,, 9 A.M.	W.
,, 22	27	8 12 A.M.	48	8 ,, 9 A.M.	W.N.W.
,, 25	20	1 24 P.M.	48	1 ,, 2 P.M.	W.N.W.
,, 26	16	10 36 A.M.	40	12 ,, 1 P.M.	W.
,, 27	15	2 48 A.M.	43	3 ,, 4 A.M.	W.N.W.
,, 31	15	10 18 P.M.	46	10 ,, 11 P.M.	N.W.
1855.					
January 1	19	1 24 A.M.	48	3 ,, 4 A.M.	W.N.W.
March 1	15	2 0 P.M.	46	2 ,, 3 P.M.	W.N.W.
,, 18	15	2 30 P.M.	46	2 ,, 3 P.M.	W.N.W.
April 10	24	0 5 P.M.	51	0 ,, 1 P.M.	W.N.W.
,, 11	18	2 45 A.M.	48	3 ,, 4 A.M.	W.N.W.
October 24	16	7 15 A.M.	40	5 ,, 6 A.M.	W.

Mean horizontal motion of the AIR between any one hour of the day & the next hour following for each Season for the Years 1852.3.4 & 5. See table VIII



he next hour following, for each of the seasons, Plate Q.

5–16	16–17	17–18	18–19	19–20	20–21	21–22	22–23	23–24
17·8	17·3	16·0	15·8	16·0	15·7	15·3	15·0	14·5
13·1	12·3	11·8	10·6	9·9	9·0	9·0	8·7	8·8
13·3	13·2	12·0	12·1	10 6	9 8	9·1	9 2	9·6
13·3	13·2	12·3	11·7	12·0	11·9	11·7	11·3	10·9
15·0	14·4	13·5	13·1	13·4	13·6	13·5	13·3	14·0
15·7	15·5	14·3	12·8	11·3	10·9	11·0	10 6	10 7
15·0	14·8	13·5	12·7	11·9	10·7	10·4	9·9	10·3
13·0	12·2	11·3	10·4	10 9	10·6	10·2	10·0	10 0
15·6	14·9	14·5	14·8	14·9	15·0	14·0	14·2	14·3
15·1	14·5	13·7	13·1	11·9	11 4	11·0	11·0	11·1
13·5	13·8	13·0	11·8	11·0	10 2	10·4	10·2	9·8
14·1	13·7	13·4	13·3	13·3	13·0	13·1	13·4	13·0
15·8	15·3	15·3	14·7	14·3	13·7	13·8	13·7	13·4
15·7	15·1	14·9	13·3	12·2	11·4	11·7	11·7	11·1
13·7	13·7	12·7	12·5	11·8	10·9	10·7	10·9	10·7
11·9	11·4	10·8	9·9	9·3	9·0	9·2	9·0	9·1
6·05	15·47	14·82	14·60	14·60	14·50	14·15	14·05	14·05
4·90	14·35	13·69	12·45	11·32	10·67	10·67	10·50	10·42
3·87	13·87	12·80	12·27	11·32	10·40	10·15	10·05	10·10
3·07	12·62	11·95	11·32	11·37	11·12	11·05	10·92	10·75
4·47	14·07	13·31	12·66	12·15	11·67	11·50	11·38	11·33

PROCEEDINGS.

EIGHTH SESSION, 1855-56.

ANNUAL GENERAL MEETING.

St. George's Hall, 18th October, 1855.

THE REV. DR. THOM, V.P., in the Chair.

The Secretary read the following REPORT:—

At the commencement of last Session, the Council of this Society felt themselves in a new position, and one that was not free from anxiety and difficulty. The objects and operations of the Society had been extended, the number of meetings had been greatly increased, and prospects of additional advantages had been held out to an enlarged number of members. They have now the satisfaction of stating that their anxiety has been dispelled, and their most sanguine hopes more than realised. They resign the offices which the members kindly entrusted to them, in the confidence that never were the pecuniary or intellectual resources of the Society so abundant as at present; and that its reputation was never more widely extended or placed upon a more secure basis.

Some delay occurred, at the commencement of last Session, before the necessary formalities could be complied with respecting a place of meeting. For local and other reasons, the members were desirous to meet in St. George's Hall; and they felt that the operations of their Society, which promotes no personal or party interest, were quite in character with the general objects of the building, and with the intellectual researches to which it was first devoted. They have the pleasure of stating, what is already known to the members, that the Town Council at once confirmed the recommendation of the St. George's Hall Committee, in granting them suitable accommodation; and they desire, on the part of the Society, gratefully to recognise the kind and handsome spirit in which they were met. It is right to mention too, that the payments made under this head are intended merely to cover the estimated expenses,—such as lighting, heating, porters, cleaning, &c.

In the new arrangements of the Society, one of the experiments tried was to avoid the issue of weekly circulars; which to so large a number of members was both costly and troublesome, and to the majority of no use whatever. Accordingly, a card was issued to every member, for the purpose of showing the evenings of meeting; and an advertisement was inserted in each of three local papers, to show the subjects to be treated of. The experience of the Session has shown that the general plan is a good one, and the retiring Council accordingly recommend it to their successors. They also believe that it may be carried out in the future, with greater economy and increased success.

In conformity with a recommendation contained in the last Annual Report, the List of Members was printed after the 1st of January last, and issued to the members in the form of a separate tract. The new code of Laws, which had been adopted at the extension of the Society, was issued about the same time; and the recent postal regulations will afford increased facilities for transmitting any such documents in future, to distant members.

At the commencement of last Session, the first volume of the Society's Proceedings and Papers was out of print, and for some time, copies of it had been sold at a Guinea

each. The Council resolved to re-print it, especially as it was thought desirable to publish all the volumes of the Society. This has been done, and the volume may now be procured by the members, at less than half its original cost. As every copy of this re-print is intended for sale, the expenditure under this head may be regarded in the light of an investment of a portion of the funds.

With the hope of making the Society more useful, an effort has been made to put the Library and Museum in order, and make their contents thoroughly available to the members. Accordingly, a catalogue of both has been formally made out, and laid before the Council by the Librarian and Curator respectively. The Council are in treaty for a suitable place of deposit for them; and they hope that the arrangements may be completed early in this Session. In the meanwhile, several of the volumes have been bound, and miscellaneous pamphlets have been arranged.

About the middle of the Session, the attention of the members was drawn, "by one of themselves," to the best means of promoting Science in the locality; and the remarks made, though privately issued, were thought to be of such importance as to call for a more extended and formal circulation. The substance of them was therefore, by the direction of the Society, printed in the Proceedings, with a suitable introduction; and an edition from the standing types was distributed with an accompanying circular. This, of course, was a special act, the good effects of which it was hoped would be seen during several Sessions; and the numerous kind responses which it has already elicited have satisfied the Council that this was the exercise of a wise discretion.

In the course of the Session, the Diploma which had been prepared for the use of the members, was issued to all those within the limits of the town delivery; and a small charge was made for the mere cost of paper and printing. The copies for the more distant members—which it was inconvenient to forward—were also prepared; and they may be had on application to the Honorary Curator.

From the moment that the Society extended its objects and operations, it was foreseen that the duties would be so heavy—even those of a routine and mechanical kind—as to require the appointment of an Assistant Secretary. For this the new Laws had sufficiently provided; and one of the earliest acts of the Council of the past Session, was to set apart a specific sum, as a permanent remuneration for the suitable discharge of the duties. They have also appointed a gentleman, in whose zeal and ability they have much confidence; that the labours of the Session may at once proceed regularly, without undue pressure upon any of their Honorary Officers. During the past Session, however, in which many additional duties were necessary, and while the detailed course of proceeding was not yet established, they directed that the same sum should be employed, in procuring such assistance as the circumstances required.

For a detailed account of the business of the Session, the Council refer with pleasure to the seventh volume of Transactions, which has just been issued to the members. They venture to believe, that few volumes, equal in interest and value, have issued from the Liverpool press. It contains more than 70 illustrations; the separation of the Transactions from the Proceedings is an obvious improvement; and the quality of the papers is of a superior kind. Though the past Session was the first occasion on which the members felt themselves called upon to investigate Scientific subjects specifically, it will be seen that Science occupies rather more than one-third of the papers in the Transactions. The Council believe that the formal publication of the volumes will benefit the Society both in a moral and material point of view.

The number of members on the roll of the Society, during the past Session, was as follows—Resident 248, Non-resident 164, lady associates 4; total 416 paying members. There are also 28 Honorary members, to whom the volumes are sent without payment. The estimated income of the Society is about £340; and the Council are of opinion that £280 will in general suffice for the publication of a handsome volume, and for the working expenses of the Society. On this occasion, they felt that they would be justified in exceeding these limits; as they were required not merely to conduct the business of a single Session, but also to lay a secure foundation upon which the labours of their successors may be safely built.

The actual receipts by the Treasurer, during the Session, have amounted to £328 0s. 6d., and the whole Sessional expenses to £316 12s.; leaving a balance to the credit of the Session of £11 8s. 6d. The Council felt that they could not better employ this sum, and the funds which remained in the Treasurer's hands after the re-printing of volume I, than in putting the Society's property in order, and preparing to turn the whole of it to a practical and useful account. Their successors in office will be required to make a small outlay of a similar kind, in printing a Catalogue of the Library, and in procuring suitable furniture; after which, it is expected that the operations and the expenses of the Society will be of a uniform character from year to year.

The volume for the past session is of so much interest, that the Council did not hesitate to print a larger edition of it than of any of the previous ones. Several hundred copies are therefore left in stock, for sale to the public and to present and future members. If the whole of the volumes in stock be estimated at members' prices, their value will be about £700. If to this we add £70 of arrears, and the moderate estimate of £250 for the Library, Museum, and miscellaneous property of the Society, we have in round figures, £1000 worth of property realized during the short period of seven years. The donation of numerous valuable illustrations has contributed in no small degree to the high character which the volumes have sustained; and the Library and Museum are almost exclusively the product of donations, of which an unusually large number were made in the course of last Session.

One of the extra duties discharged during the past Session, has been the extension of that friendly reciprocity which prevails between other learned Societies and this one. Several Societies, chiefly of a scientific character, have expressed their readiness to reciprocate publications with us; and similar efforts will be made till all the principal learned Societies in the kingdom be included in the arrangement; as well as an increased number of those on the Continent and in America. In connexion with this subject it may be mentioned, that the members of the Society undertook an excursion to Shrewsbury, on Thursday the 9th of August, when they were admitted for the day to the Museum and meetings of the Congress of the Archæological Institute. On the part of this Society, and by the direction of the Council, they invited the members of the Institute to meet at some convenient time, within the limits of the two counties of Lancashire and Cheshire. Again, at the meeting of the British Association for the Advancement of Science, held this year at Glasgow, your Delegates had the pleasure to present copies of the last volume of Transactions, for the Library of the Association itself, and also to the distinguished individuals whom they enrolled last year as Honorary Members.

The Council have to deplore, in common with the members at large, the loss of several valued friends who have been removed by death. Besides ordinary members, the Society has lost two of its most prominent officers since the close of the meetings in May. The first of these was the Earl of Sefton, President of the Society, and one of its original members; and the other, still more recently, Archdeacon Brooks, one of the Vice-Presidents from the first, and who on several occasions occupied the chair at the meetings of the Society. The high estimation in which both were held, has been shown by the spontaneous tributes of numerous sorrowing survivors; and the members are fully sensible of the loss which this Society has sustained by the bereavement, as well as the public in general.

In suggesting the names of other gentlemen to occupy the places of those who retire, the Council have acted to the best of their judgment; and they have the gratification of knowing that those who succeed them will have a less difficult task than that which fell to themselves. They retire from office, grateful for the unvarying kindness and support which have enabled them to realise such a measure of success; and confident that the future progress of the Society will be the best commentary on the efforts which they have made in its cause.

The Treasurer's Balance Sheet, signed by the Auditors, was also read.

HISTORIC SOCIETY—Sessional Income, in Account with THOS. AVISON, Esq., Treasurer.

	£	s.	d.	£	s.	d.
I.—THE VOLUME.						
Printing, binding, &c. ..	153	13	6			
Illustrations	31	6	9			
Authors' copies	4	10	0			
				189	10	3
II.—SESSIONAL CHARGES.						
Circulars and cards.....	5	19	0			
List of Members.....	7	17	6			
Postage of circulars, &c..	8	1	7			
Tea, coffee, & attendance	11	18	0			
Use of St George's Hall.	15	15	0			
Advertisements	10	0	0			
Assistant Secretary.....	50	0	0			
Delivery of circulars, &c.	3	9	11			
Collector and Accountant	9	13	0			
Messages, parcels, miscellaneous	4	7	9			
				127	1	9
				£316	12	0
Balance to the credit of the Session..				11	8	6
				£328	0	6

	£	s.	d.	£	s.	d.
Arrears	22	1	0			
Entrance fees	9	9	0			
Annual subscriptions	261	9	0			
Life compositions	26	5	0			
Books sold	8	16	6			
				328	0	6
				£328	0	6

Examined by

PETER R. M'QUIE,
SAMUEL GATH, } Auditors.

HISTORIC SOCIETY—Property and Cash, in Account with THOS. AVISON, Esq., Treasurer.

	£	s.	d.	£	s.	d.
I.—PERMANENT CHARGES.						
Glass cases and fitting	26	4	9			
Books bought, binding, &c.	4	10	2			
New minute and receipt books	4	7	0			
New Laws	6	15	0			
Stationery	5	18	6			
				47	15	5
II.—REPRINTING VOLUME I.....				54	14	6
III.—SPECIAL EXPENSES.						
Annual Report (separate), Excursion circulars, Science in Lancashire and Cheshire, and Mr. Wright's Lecture.....				18	15	5
				£121	5	4

	£	s.	d.	£	s.	d.
Balance in Treasurer's hands, last October	97	5	11			
Balance to credit of last Session	11	8	6			
				108	14	5
Balance due Treasurer				12	10	11
				£121	5	4

Examined by

PETER R. M'QUIE,
SAMUEL GATH, } Auditors.

It was moved by J. T. DANSON, F.S.S., seconded by THOMAS MOORE, SEN., Esq., and resolved,—

That the Report be adopted; and that it be printed and circulated with the Proceedings of the Society.

It was moved by JOHN POOLE, Esq., seconded by JOSEPH BOULT, Esq., and resolved,—

That the Abstract of the Treasurer's Accounts now read, be passed and printed with the Report.

It was moved by DR. HUME, seconded by DAVID BUXTON, Esq., and resolved,—

That the thanks of the Society be given to all those gentlemen who have contributed Illustrations, in whole or in part, for Volume vii; and especially to Mr. Mayer, the Honorary Curator of the Society.

It was moved by THOMAS GRAY, Esq., seconded by DR. MACINTYRE, and resolved,—

That the thanks of the Society be given to the retiring Council and Officers, for their services during the past Session.

It was moved by JOSEPH BOULT, Esq., seconded by J. T. DANSON, F.S.S., and resolved,—

That the thanks of the Society are especially due to the Rev. Dr. Hume, for his invaluable services in the office of Honorary Secretary, since the Society was established; by which its present position has been mainly secured.

A Ballot having been taken for the Officers and Sectional Members of Council, by means of the slips forwarded to the members, the result was announced by the Chairman. (See p. ii.)

On the motion of the REV. THOMAS MOORE, M.A., a vote of thanks to the Chairman was passed by acclamation.

1*st November*, 1855.—MISCELLANEOUS MEETING.

J. T. DANSON, F.S.S., V.P., in the Chair.

The following Donations were laid upon the table:—

From the Society. Proceedings of the Literary and Philosophical Society of Liverpool, during the 44th Session, 1854-55. No. 9.

From the Society. Proceedings of the Liverpool Architectural and Archæological Society, Volume II, Part 1, 1850-51.

From the Society. Transactions, Laws, Bye-Laws, and Sixth Annual Report of the Liverpool Chemists' Association, with list of the officers and members, also a Catalogue of the Books belonging to the Library, and a list of Donors to the Museum fund, 1855.

From the Author. Report of the General Board of Health, on a Preliminary Inquiry, respecting Great Crosby and Litherland, in Lancashire. By Robert Rawlinson, C.E., F.G.S., 1855.

From John Mather, Esq. Accounts of the Trustees of the Liverpool Docks, for the Years ending June 1838, '39, '40, '41, '42, '45, and '47.
A List of Voters in the Southern Division of the County Palatine of Lancaster, for the Hundred of West Derby.

From Dr. Hume. Geological Notices of the Environs of Glasgow, the shores of the Clyde, and the Island of Arran. By James Bryce, jun., M.A., F.G.S., 1855.
Account of the Public Dinner given to Charles Roach Smith, Esq., at Newport, Isle of Wight, on Tuesday, August 28th, and of the Conversazione at Ryde, August 29th, 1855.

From the Author. Collectanea Antiqua. By Charles Roach Smith, F.S.A., Vol. IV, Part 2.

From the Author. Views of Liverpool, about the year 1655 and in 1855, with Key. By Augustus Harding. Dedicated to the Historic Society.

Mr. Bloxam exhibited the first impression of an accurate portrait of Mr. Russell, the Crimean Correspondent of the *Times*.

Mr. Gray drew attention to a new manure, the basis of which is phosphate of lime. It is a natural deposit on some of the islands of the Gulf of Mexico. He also exhibited a blank marriage certificate from Gretna Green.

Mr. Macfie exhibited a large number of ancient objects in bronze and brass. A detailed description of them on some future occasion, was promised to the Society.

Dr. Hume pointed out peculiar characteristics of some idols of the ancient Mexicans, as figured in a large work illustrative of Mexico.*

Mr. Gray called the attention of the Society to two letters in the London *Times* of that day, one from Walter Savage Landor concerning an aged descendant of Defoe, the other from Charles Dickens, Thomas Carlyle, and John Foster, in reference to the god-daughter of Dr. Johnson. Both of these aged persons required pecuniary assistance; and Mr. Gray noticed the letters for their sakes.

The Rev. John James Moss, M.A., exhibited an interesting case of WATCHES, and read the following remarks descriptive of them.

The watches exhibited, though only the nucleus of a collection, and by no means a complete series, are interesting as individual specimens of the art at various periods, from the time of Elizabeth to the commencement of the last century. They are most of them perfect, and of very elegant design and workmanship. In addition to this, some of them are of historical interest, and they formed part of the late Mr. Bernal's collection.

No. 1 is a *memento mori* watch, of the time of Elizabeth, made by Charles Robinet,—from his name, an English maker. It has Latin mottoes round portions of the skull, which forms the case. The watch is of a similar kind, though differing in size and material, to that presented by Mary Queen of Scots to Mary Setoun of the house of Wintoun, one of the four Maries, maids of honour to their unfortunate Sovereign. This latter is now in the possession of the Lauder family. An engraving of it, in the Illustrated News Almanac for 1852, is sufficiently correct for comparison.

No. 2 is a scolloped or padlock locket-shaped watch, with crystal front and ribbed crystal back. The sides are of gilt metal. It is figured in Mr. Bernal's catalogue, and was made by Gio Balt Nascarone. It belongs to the same period as the last described.

No. 3 is a silver watch purchased at Mr. Bernal's sale, and said to have been given by Charles I to Colonel Hammond at Carisbrooke. I believe there is no account of this gift in any history or memoir of that monarch; but it was alluded to as a relic of him by Mr. Pettigrew, at the last meeting of the British Archæological Association. In the centre of the outer case there is an engraving of the monarch praying as he is represented in the frontispiece of Eikon Basilike. At the back of the inner case is the engraving of a man in a gown praying, with our Saviour above, and the legend in a scroll,—"And what I sai to you I sai unto all,—watch." I may mention it as curious that this quotation from Scripture is not exactly according to our authorized translation, the Geneva version, or that by Cranmer. The watch was made in London, by Richard Bower.

Nos. 4 to 7 are gold watches enamelled by the famous enamellers of Blois. This art, according to Mr. Morgan, in a Paper of his on watches in the Archæologia, was first used for such a purpose by Toutin in 1640, and ceased about the year 1680, or towards the close of the century. His most celebrated pupil, Vanguer Piu, painted the watch said to have belonged to Anne of Austria, which I purchased at Mr. Bernal's sale. It is indeed a specimen as worthy of her taste as of the artist's celebrity. (*See plate.*)

Another of Toutin's pupils named Huoud painted the watch representing the Roman lady who nourished her father condemned to starvation. She was permitted to see him daily—and her history has, as you are all aware, been immortalized by Byron.

* "Viage Pintoresco y Arqeolojico sobre la parte mas interesante de la Republica Mejicana, a los anos transcurridos, des de 1829 hasta 1834, por le Arquitecto Don Carlos Nebel, 50 laminas Lito grafidas, con su texto explicativo. Paris y Mejico MDCCCXXXIX."

DIAL
FRONT
BACK
INNER CASE
INNER CASE
ROUND THE RIM
ORNAMENT
OPPOSITE DIAL.
OPPOSITE WORKS

This watch belonged to Prince Albert's mother, the Duchess of Saxe-Coburg, and was purchased at her sale in 1852. It was made at Geneva, by Abraham Carl Liatte.

The enamelled watch No. 6, is by an unknown artist. The exterior is very minutely finished with classical subjects on the front and back, but the landscapes in the interior are less beautiful. The works were made at Amsterdam by Josephus Norris.

The enamelled watch No. 7 is interesting as containing in the inner case a portrait of the Earl of Rochester, and on the dial one of Charles II. They are probably the work of a less eminent artist than Piu or Huoud, but are nevertheless of considerable merit. The works are by Robert Dingley, London.

No. 8 is an alarum pocket clock. The case is made of brass, with open work for the emission of sound. The maker's name is Pierre Maingot, Paris—date probably early in the 17th century. It has a curious key.

No. 9 an alarum watch of silver. The case is cut in an intricate pattern, for the emission of sound. Date, the end of the 17th century.

No. 10, a gold watch made in Liverpool during the latter half of the last century, by Ralph Eden. The outer case is much older, and of the kind fashionable during the reign of Queen Anne.

The following Paper was then read:—

On the Saxon Element in the Diction of English Poetry. *By David Buxton, Esq.**

8th November, 1855. LITERARY SECTION.

The Rev. Dr. Thom, V.P., in the Chair.

The following Donations were laid upon the table:—

From the Society. Proceedings of the Society of Antiquaries of Scotland, Part iii, 1855.

From the Society. Journal of the Society of Arts and of the Institutions in Union, Vol. III, Nos. 147, '48, '49, '50.

From the Society. Journal of the Statistical Society, parts 1, 2, and 3, for 1855.

From Lord Londesborough. Miscellanea Graphica, parts 5 and 6.

From James Newlands, C.E., Borough Engineer. List of Sewers in the Borough of Liverpool, 1855.

From Robert Rawlinson, C.E., F.G.S. Report of the Committee of Scientific Inquiries, in relation to the Cholera Epidemic of 1854.†

Appendix to ditto.

Letter from the President of the Board of Health, accompanying a Report of Dr. Sutherland, on the Cholera of 1854 in London.

Report on the Results of the different modes of Treating Cholera in London.

Report on the Results of the different modes of Treating Cholera in the Provinces.

Report of the Medical Council to the President of the General Board of Health, in relation to the Cholera Epidemic of 1854.

Dr. Hume exhibited an ancient sheep-bell, which had been dug up near Llanbadrig, in Anglesea. It is identical in form with the hawk's bell of heraldry; and is supposed to belong to the 15th century.

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* Transactions, p. 35.

† Mr. Sansom drew attention to twenty-seven beautifully executed plates in this volume. They represent the microscopic appearance of the water with which various parts of London are supplied. This led to a notice, by Mr. Boult, of some peculiarities of the Liverpool water.

Dr. Hume also drew attention to a pentagonal crystal of stone, about two inches long, and half an inch in diameter. A stone at the iron works of Ystalyfera, near Swansea, had been nearly in a state of fusion for a considerable time; and on the fire which it sustained being blown out, it split into crystals, of which this was one.

Mr. Danson, V.P., read some remarks on the Paper of Mr. Buxton, which had been laid before the Society at the previous meeting. See note, page 48.

The following Paper was then read:—

LIVERPOOL: MEMORANDA TOUCHING ITS AREA AND POPULATION, DURING THE FIRST HALF OF THE PRESENT CENTURY. *By J. T. Danson*, F.S.S., V.P.*

15th November, 1855. SCIENTIFIC SECTION.

THE REV. DR. THOM, V.P., in the Chair.

Mr. Thomas Kyffin Roberts, of St. Asaph, was duly elected a Member of the Society.

The following Donations were laid upon the table:—

From the Society. Journal of the Royal Geographical Society, with maps and illustrations, vol. XXIV, 1854.
Address at the Anniversary Meeting of the Royal Geographical Society, by the Earl of Ellesmere, K.G., D.C.L., President.

From Professor Sedgwick. A Synopsis of the Classification of the British Palæozoic Rocks, with a systematic description of British Palæozoic Fossils, by Professor Sedgwick, of Cambridge, and Professor McCoy, now of Melbourne University. 2 vols. 4to.

From Sir John Richardson, C.B., M.D. Magnetical and Meteorological Observations at Lake Athabasca and Fort Simpson, by Capt. J. H. Lefroy, Royal Artillery, and at Fort Confidence, in Great Bear Lake, by Sir John Richardson. Printed by order of Government, 1855.

From the Author. Four Papers, viz.: (1) On the Action of Organic Acids on Cotton and Flax Fibres; (2) On the Action of Gallic and Tannic Acids in Dyeing; (3) On the Adulteration of Oils, by F. Crace Calvert, F.C.S., Professor of Chemistry, Manchester; and (4) On Alloys, by Professor Calvert and R. Johnson, Esq., Manchester.

From the Author. Paper on Ice Impediments in Australian Voyages, by John Thomas Towson, Esq.

From J. C. Dalton, Esq. Third Annual Report of the Committee of the Free Public Library and Derby Museum of the Borough of Liverpool; October, 1855.

From William Blackmore, Esq. Minutes of Evidence on the Liverpool Election Petition, taken before the Select Committee, with the Proceedings of the Committee, 1853.

From Thomas Moore, Sen., Esq. Newspaper Slip—Advice to Emigrants to New Zealand.

Mr. Whitehead exhibited a very interesting specimen of the shell known as *Voluta punctata* (Swainson), or *Aulica punctata* (Gray).

Mr. Sansom exhibited a print from a highly magnified photograph of *Navicula angulata*. It was supposed to be magnified 16,000 diameters, and the spots formerly supposed to be lines were seen as dots of a hexagonal shape. These dots had been

* Transactions, p. 23.

measured, and were found to be 52 thousandths of an inch in diameter, in their natural state.

Dr. Hume exhibited a portable Gyroscope, lent for the purpose by Mr. Chadburn of Lord street, and drew attention to the various motions of which it was susceptible. He also explained to the meeting the scientific* principles which were thus illustrated.

Mr. H. Meeson, on the part of Mr. Agnew, of Manchester, laid before the Society a selection of sixteen Photographs, from the series of Fenton's Crimean Illustrations. They consisted of six portraits of Generals, and ten Landscapes and Groups, in and near Balaclava.

The following Paper was then read:—

DESCRIPTION OF A PATENT ABACUS. *By J. Gregory Jones, Esq.*

This Abacus was invented and patented by Mr. Jones, who is one of the officers of the Collegiate Institution. It was placed in the meeting-room. The object of it is to familiarize the pupils of our Schools with the operations of Addition; and thus to save the time of both teacher and pupils, or to afford greater leisure for the explanation of principles. By the simple movement of a slide, a vast number of combinations can be obtained, each of which may be distinguished with facility, by a number, for reference to a printed Key. This states the correct sum of every arrangement of columns of figures, and thus affords an easy means of comparing the result which the pupil produces. The practical mode of using the instrument was shewn; and some of those to whom its use had been familiar, displayed great celerity and accuracy in the process of adding.

6th December, 1855. ARCHÆOLOGICAL SECTION.

SAMUEL GATH, ESQ., in the Chair.

The following gentlemen were duly elected members of the Society:—

William Allcard, Esq., Bank House, Warrington.
Edward Batty, Esq., 34, Stafford Street.
J. Black, M.D., F.G.S., Southport.
John Bowes, Esq., Warrington.
F. Crace Calvert, F.C.S., &c., Royal Institution, Manchester.
James L. Crosse, Esq., 6, Sandon Terrace.
Edward Estill, Esq., Orange Court, Castle Street.
David Johnson Macfie, Esq., Bachelor Street, Dale Street.
John Newton, Esq., 15, West Derby Street.
William R. Sandbach, Esq., Bank Buildings, Cook Street.
John R. Shawe, Esq., Arrowe, Woodchurch, Cheshire.
George F. Wilson, F.R.S., F.S.S., Belmont, Vauxhall, London.

The following Donations were laid upon the table:—

From the Institute. The Archæological Journal, published under the direction of the Central Committee of the Archæological Institute; volumes VI, VII, VIII, IX, X, XI, and parts 1 and 2 of volume XII.

* These experiments were exhibited by M. Foucault, the inventor, at the Meeting of the British Association at Liverpool; and an account of them is given in the Report for that Meeting, Proceedings, p. 56, under the title "*Nouvelles Experiences sur le Mouvement de la Terre au Moyen du Gyroscope.*" An account is also given in the *Comptes Rendus de l' Académie des Sciences.* On March 12th, 1855, the nature of these experiments was explained at the Ashmolean Society, Oxford, by the Rev. Robert Walker, M.A., Reader in Experimental Philosophy. Allusion was also made to them by the President, Lord Wrottesley, at the Anniversary Meeting of the Royal Society, November 30th, 1855, in presenting the Copley Medal to M. Foucault.—*Proceedings of the Royal Society*, volume vii, p. 574.

From the Cambrian Archæological Association. Archæologia Cambrensis, for July and October, 1855. Third series, Nos. 3 and 4.

From the Author. British Antiquities; their present treatment and their real claims, by A. H. Rhind, F.S.A. London and Scotland. Pamph., 1855.

From the Editor. Parallel Passages from two Tales, elucidating the origin of the Plot of Guy Mannering, edited by Gilbert James French, Corr. F.S.A., Scot., and printed for presentation. Pamph., 1855.

From the Rev. P. S. Dale, M.A. Thirteen Pamphlets, principally from the earlier press of Liverpool, consisting of the following:—

The Dispensary, a Poem, by James Clarke; Liverpool, 1783. A Sermon, preached before the Mayor and Corporation, at St. George's Church, Liverpool, by the Rev. Samuel Renshaw, M.A.; London, 1793. Miscellany Poems on moral subjects; Chester, 1750. A Sermon preached at the Assizes held at Lancaster, 19th August, 1787, by the Rev. Thomas Wilson, of Clitheroe, author of the Archæological Dictionary; Leeds, 1797. Christian Knowledge and Universal Privilege, a Sermon preached at the opening of the Warrington Blue Coat School, by the Rev. Edw. Owen, M.A.; Warrington, 1779. A Charge delivered to the Clergy in the Diocese of Chester, in 1814, by Geo. H. Law, D.D., Bishop; Chester, 1814. Assize Sermon preached at York, by the Rev. John Vause, M.A.; Liverpool, 1811. Commencement Sermon at Cambridge, by Law, Prebendary of Carlisle, July 1, 1804. Charge delivered to the Clergy of the Diocese of Chester at the primary Visitation, 1825, by C. J. Blomfield, D.D., Bishop; London, 1825. Remarks on Mr. Lancaster's System of Education, by William Fell, Teacher, Warrington; London, 1811. Pastoral Thoughts on the Aspect of the Times, in four Sermons, preached at St. George's, Everton, by the Rev. P. Buddicom, M.A., F.S.A.; London, 1830. Three Sermons on Article xvii of the Church of England by the Rev. Edward Hull, M.A.; Liverpool, 1821. A Sermon preached at Wigan Church, and published by request; Liverpool, 1753.

Dr. Hume exhibited a gutta percha impression of a leaden seal, found at Nantwich, in Cheshire, in May last. The original was about six feet beneath the surface of the Crown Inn yard. It is now in the possession of Mr. H. Ecroyd Smith, author of the Reliquiæ Isurianæ. The legend is SIGILL SIMONIS FIL BAN (ulfi).

Dr. Hume also drew the attention of the Society to some numbers of the *Illustrated Sydney News*, which seemed to have been of great interest as an exposition of Colonial life. The 90th and concluding number contained three Australian scenes, and four illustrations of native Zoology.

An ancient vase was handed round for inspection, the property of Valentine Bird, M.D., of Seacombe. It was found in South America, in the excavations for the Lima and Arica Railway, and contained human bones in a state of great preservation.

Mr. Mayer exhibited an elaborately-made Tea Caddy of the usual form, but very large. The ground work is wood, over which is laid in mosaic work a variety of patterns in squares and stars, and amongst the rest are masonic emblems—the level, rule, compasses, pillars, sun, moon, &c. On the panel in the front are two subjects in engraving from copper plates, one representing the fable of the bundle of sticks, and the other a jolly looking landlord, whose appearance shews that he has paid attention to creature comforts, some of which surround him, whilst he is very anxiously watching the tap of a large hogshead of ale which is running into one of the brown jugs of the day. The whole of the ornaments are composed of pottery work, and display great ingenuity in the adjustment of the pieces and the arrangement of the colours. Probably all which were then known are displayed; they thus shew in an interesting manner the state of the manufacture of earthenware in Liverpool about 1780.

Mr. Mayer also exhibited an Ivory Comb measuring 7 inches long by 5¼ broad. It is of the usual form, of the large mediæval specimens preserved in the cabinets of

antiquaries. The teeth are placed on each side, and are 1¼ inch long; those on one side are extremely heavy and thick. At each end of the teeth are compartments filled with scrolls and flowers. Extending the whole length of the centres are two subjects in high relief, one of them representing a hunting scene, and the other a hawking scene. From the costumes it is thought to have been made about the period of Mary Queen of Scots.

Mr. Gray exhibited a copy of Hogg's Queen's Wake, which had been presented by the author to his nephew, Mr. James Gray. It was interesting from containing in the margin an autograph key to the modern poets, indicated under the bardic titles.* Mr. Gray exhibited with this, the Album of Miss M. A. Browne, (the late Mrs. James Gray), containing original poems and drawings of great interest; also a volume of MS. letters from the various literary persons with whom she had been in correspondence, including many from Miss Mitford, Mrs. Hofland, &c.

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* This was the edition of 1822, which contained numerous additions to the original Poem. The following are the principal persons indicated, and the respective descriptions of them:—

1st Bard—David Rizzio.

"The stranger youth,
The gaudy minstrel of the south,
Whose glossy eye and lady form
Had never brav'd the northern storm."

8th Bard—Mr. Wm. Tennant, Author of "Anster Fair," afterwards Professor in the University of St. Andrews.

"The Eighth was from the Leven coast."

"Mounted the Bard of Fyfe on high,
Bushy his beard and wild his eye;
His cheek was furrowed by the gale."
* * * *
"Calm and benignant as a child,
Yet spoke to all that viewed him nigh;
That more was there than met the eye."

9th Bard—Professor Wilson.

"His locks were fair as sunny sky,
His cheek was ruddy, bright his eye,
His speech was like the music's voice
Mixed with the cataract's swaying noise;
His harp strings sounded wild and deep,
With lulling swell and lordly sweep."

10th Bard—"The Author, James Hogg."

"The Bard on Ettrick's mountain-green
In nature's bosom nursed had been."

15th Bard—"The Rev. James Gray, afterwards my brother-in-law.—J. H."

"The next was bred on southern shore,
Beneath the mists of Lammermore.
* * * *
Well toned his voice of wars to sing,
His hair was dark as raven's wing;
His eye an intellectual lance
No heart could bear its searching glance;
But every Bard to him was dear,
His heart was kind, his soul sincere."

16th Bard—"Allan Cunningham."

"The next was from a western vale,
Where Nith winds slowly down the dale;
Where play the waves o'er golden grain,
Like mimic billows of the main.
Of the old elm his harp was made,
That bent o'er Cluden's loneliest shade.
* * * *
That Harp could make the matron stare,
Bristle the peasant's hoary hair,
Make patriot breasts with ardour glow,
And warrior pant to meet the foe."

Mr. Mayer read the following transcript of a letter, the original of which is in the possession of J. Y. Akerman, Esq., Sec. S.A. It was written by Cornet Pease to his brother-in-law, Captain Adam Baynes, of the Parliamentary Army. The brother Richard mentioned in the postscript, was a Captain Richard Pease, also a Roundhead officer. The letter alludes to the unfortunate termination of Sir George Booth's rising in favour of Charles II.

Dr Sr

I suppose ere this you have an acct of the the (*sic*) great victory obtained with little bloodshed upon Friday last. This day Chester was surrendered to my Lord Lambert without any termes but his own, some of the enimyes horse went hence last night and this morning to the number of 300 to chirt castle in Wales under the comand of Sr Thomas Middleton, the owner of it, to which place our Troope and 3 more of my Ldr Regimt & some foote are marchd this afternoone, tomorrow god willing I purpose to be with them, they by this night at Rixam. Ld Kilmurrey, Sr Will. Neale and many other persons of quality are taken, I desire you will please to prsent my choyce respects to all your sweet babyes and my dear sister & all friends & accept the same yourselfe

Frm

Sr.

Your most affectio: & obliged Brother
J. Pease.

Chester, Aug. 25. 1659.

Sr

Dr Devevier* is here and presents his respects to you and yor pray remember me to Bro. Richard and his wife if they be in towne.

Mr. Gray exhibited an interesting portrait of Milton, apparently of the date 1650 to 1670, painted within the separable sides of a Spanish dollar.

In illustration of his Paper to be read, Mr. Stonehouse exhibited a view of Dalton Castle, and a plan of the Pile of Fouldrey. Mr. H. Johnson also exhibited specimens of Iron Ore from Cleator, near Whitehaven.

The Secretary announced that a room had been taken for the reception of the Society's Library and Museum, at No. 57, Ranelagh Street.

The following Paper was then read:—

A Day in Low Furness. (Abridged.) *By James Stonehouse.*

The districts of High and Low Furness abound with objects of interest, in which the antiquarian, the geologist, the botanist, and the artist, would delight. Low Furness is bounded by High Furness on the north, by the Leven river and Morecambe Bay on the east, by the Irish Sea on the south, and by the Duddon river on the west. The boundary line between High and Low Furness may be drawn from Aldingham on the Leven to Kirkby Ireleth on the Duddon. Furness was conquered by Agricola in his second campaign, A.D. 79, and it is said that at Dalton there was a Roman Station. The Romans made a road through Furness, remains of which were first discovered in March, 1774, near Mountbarrow House, and under Bardsea park wall another portion of it was found. In 1813, an ancient road, paved with large stones, was met with at the head of Goldmire. It would seem, therefore, that the Romans entered Furness by Conishead, whence their road proceeded to Thornwest, through Streetgate, to the place where it joins the new turnpike road to Ulverstone. Hence its direction is by Lindell to Dalton. At the cross at Dalton it turns up Scalegate to Duddon Sands.

After the Romans, the Britons occupied the country; the Danes succeeded, as the numerous Danish words still prevalent in the vicinity shew. Next the Saxons, who were followed by the Normans. Though the name of Furness is not mentioned in Doomsday Survey, yet numerous places in it are set down, as well as the owners

* Some letters of this individual will be found in the Proceedings of the Society of Antiquaries

of lands, and the extent of territory held by each. It was in a highly cultivated state, as the Survey states that sixty ploughs were owned by the chieftains and their tenants.

We first visit Walney Island, about ten miles long by one in breadth. It contains two hamlets, North Scale and Bigger, and between them is a small Chapel of Ease to Dalton. At Bigger there is an ancient dike, constructed originally by the monks of Furness, with great care, to ward off the sea. It is a mile in length, with a foot walk on the top. There are other dikes, which the islanders are obliged to keep in repair, as they hold their lands on the condition that if any are destroyed by the sea, the remainder must pay the rent of those which have disappeared, as well as their own. The sea broke over in 1774, and in 1796, and occasionally since. About fifty years ago, some curiously shaped cannons and other war implements were discovered, cast on the island probably from a wreck, in the time of Richard II.

There is a revolving light on the south end of the island. From Walney we proceed to Fouldrey, where is the fortress known as the Pile of Fouldrey Castle, constructed (Camden) about 1327, as a refuge for the monks of Furness in time of need. The published views of this ruin do not convey the best idea of what it is like. Fouldrey island has to a great extent been washed away. The castle covered about three acres, and consisted of a keep or central tower, an inner wall, a moat, now nearly filled up through lapse of time, and an outer wall. The ruins are curious, and deserve a detailed examination. Lambert Simnel landed here in 1487, and proceeded thence to Swarthmoor and Cartmel, whence he marched to Stoke-on-Trent. Of the Furness gentry he was joined by Sir Thomas Broughton, who was killed in the battle, or disappeared. Mr. Roby founds a story on this circumstance in his "Traditions of Lancashire." From the Pile of Fouldrey we proceed to Furness Abbey, which is four miles distant from the railway station on Roe Island. The ruins are said to stand on sixty-five acres of ground, and are situated in a glen called Beckansgill, or the glen of the deadly nightshade. The abbey, dedicated to St. Mary, was founded on the nones of July, 1127, by Cistercian monks, with Ewan, their first abbot. It was second in importance only to Fountains in Studley Park. At the dissolution in 1537, it had a revenue of £805 16s. 5d., exclusive of the woods, pastures, fisheries, saltworks, mills, &c. Its hospitality was great, and education was not neglected. Of the church there are remains of the chancel and vestry, the north and south aisles, the lofty arches of the nave, and the belfry or western tower, from the top of which there is a fine view of the surrounding country. The sedilia, carved, as it is supposed, by Italian artists, form some of the finest specimens extant in freestone. Our space does not admit a more detailed notice of this splendid ruin.

Dalton Castle, distant from the abbey about a mile and a half, was erected by the Furness abbots for defence and for civil purposes. It is a square block of building, and its walls are six feet thick. In front of it the market was held till it was removed to Ulverstone. Dalton is supposed to have been a Roman station, but the examination of a mound near the church did not lead to any results. Some copper weapons, probably celts, were discovered in the vicinity many years ago; and in 1804, a coin inscribed with the word SOL in Roman characters on each side. In 1799, in sinking a shaft for iron ore near Dalton, there was found at the depth of thirty feet, the trunk of a large oak tree, which had assumed the colour of ebony. The church bears date about the fifteenth century. In it there is a large stone font, curiously carved, which was brought from the abbey. Mention is made in the "Tatler" of a great festival at this place, at which a great hunt took place on the morning, and a grand ball of the neighbouring gentry in the evening.

From Dalton we proceed to Lindell, where are extensive iron mines, some of which have been worked for centuries. The Romans were acquainted with the fine iron ore of this district, some of which yields 75 per cent. of iron. The Britons, Saxons, &c., in their turn knew their value, and the abbots of Furness Abbey had the sole management and profits of the mines. At Lindell Moor, on the 28th Sept., 1643, the king's forces were beaten by the parliamentarians.

From Lindell we proceed eastward to Urswick, which consists of Little and Great Urswick. At the former is a curious place called the Stone Walls, situated in some

fields at the back of the Swan public-house opposite the post-office. Large quantities of stones are found in several fields, lying scattered about, and preserving now but little of their original condition. It is difficult to trace the plan of the structures that may have existed in bygone days. Are they druidical remains? Are they the remnants of some Sistuntian village? Or some temple of a primitive race?

Urswick Church is a small edifice, erected about fifty years after the Conquest, and is dedicated to St. Mary-in-the-Field. On the western side there is a much mutilated figure of the virgin and child. The bell bears an inscription to the effect that it was the gift of William de Harrington and his lady Margaret. The interior of the church has been lately decorated. Stained glass windows have been put in the eastern end and southern side, and encaustic tiles placed in the chancel. The monks of Furness owned the advowson before the demolition of the monastery. In 1774 a curious copper vessel, weighing three pounds two ounces, was found near the church, and in 1798 a silver coin of Otho.

From Urswick we proceed to Birkrigg, a moorland overlooking Morecambe Bay—the village of Bardsea stands at its base. From the most elevated point of Birkrigg a most extensive view may be had, embracing the Isle of Man, Cumberland, Westmorland, and the mountains of Lancashire. The moor is scattered all over with stones of every size and shape, presenting a most singular appearance. Are not these stones the remains of some town of yore, whose name and inhabitants have been forgotten?

At Aldingham there is a curious remnant of antiquity, viz., a mound and ditch and an enclosure. The mound, which is about thirty feet high is to a considerable extent washed away by the sea. It has been considered to be the mote hill, or place of assembly of the lords of Aldingham. It is said that Aldingham Church stood in the centre of the village at the conquest, and that the encroachments of the sea have left it in its present position, and several villages in its vicinity are supposed to have been swallowed up in the sea. Proceeding southward we approach the ruins of Gleaston Castle, the residence and fortress of the lords of Aldingham. In the beginning of Mary's reign it belonged to the Duke of Suffolk, father of Lady Jane Grey. It well deserves a visit by the antiquary. The way back to Pile Harbour presents no object worthy of much note, except the picturesque village of Leece scattered round a large tarn.

13*th December*, 1855. LITERARY SECTION.

J. T. Danson, F.S.S., V.P., in the Chair.

The following gentlemen were duly elected Members of the Society:—

H. C. Barton, Esq., Fishergate, Preston; and F. Steiner, Esq., Hyndburn, Accrington.

James Aspinall Tobin, Esq., late Mayor of Liverpool, having signified his wish to remain a Member of the Society, was enrolled without election or entrance fee, in accordance with Law xiii.

The following Donations were laid upon the table:—

From the Society. Transactions of the Philological Society, volumes I, II, III, IV, V, and VI; Transactions eleven parts, for 1854; Transactions, parts 1 to 6, for 1855. Appendix, containing List of Members, Laws, &c.; Dictionary of the Dakota Language, in two parts, 1st English, Circassian, Turkish; 2nd Circassian, English, Turkish, with a preface, and a table of the alphabet adopted to express the Adee-Ghey language.

From the Society. Memoirs of the Literary and Philosophical Society of Manchester, vol. XII, (second series), 1855.

From W. B. D. D. Turnbull, Esq., Hon. Mem. Several copies of an Essay on Ships' Compasses, by Thomas Allan, C.E., London.

From the Abbé Cochét. Notice Biographique sur M. Nell de Bréauté, Conseiller General de la Seine Inferieure.

From Charles Roach Smith, F.S.A. Duplicate of the Abbé Cochét's Memoir of M. Nell de Bréauté.

Mr. Marsh exhibited several Autographs, lent for the purpose by Mr. Jones, of Nantwich. They were (1) Two Reprieves, signed by Charles I; (2) A State Document, bearing the signature of Sir Walter Raleigh; (3) A Warrant under the hand of the lord keeper William, Bishop of Lincoln, the Earl of Arundel and Surrey, Viscount Conway, Sir Thomas Edwardes, Sir John Suckling, Sir John Coke, and Sir Richard Weston, directed to Bridgeman, Bishop of Chester, whose signature is endorsed, relating to a Popish conspiracy in the year 1625; (4) A Letter from Lady Hatton, widow of Edward Coke, to Sir Randolph Crew, requesting his arbitration in a dispute between herself and her late husband's executors.

Dr. Hume exhibited a pair of Wedgwood Cameos, belonging to a gentleman in Seacombe, representing Josiah Wedgwood and his Wife.

The Chairman announced the death of Joseph Brooks Yates, Esq., F.S.A., F.R.G.S., who for more than forty years had been in some way connected with the progress of Literature and Science in this neighbourhood. He thought the Society might with great propriety put upon record, their sense of his loss.

Another member, at the request of the Chairman, stated some facts* respecting Mr. Yates's connection with the local literature.

It was then moved by Thomas Sansom, A.L.S., seconded by the Rev. Thomas Moore, M.A., and resolved—

That this Society learns, with deep regret, the death of Joseph Brooks Yates, Esq., and takes this the first opportunity that presents itself, to express on behalf of its members, the deep sense of his services to the Literature and Science of the district, a feeling which they possess in common with all who are or have been connected with those pursuits.

The Secretary was directed to forward a copy of this resolution to the family of the deceased gentleman.

The following Paper was then read:—

THE ENGLISH POOR LAW SYSTEM, VIEWED IN RELATION TO EDUCATION AND MORALS; *By the Rev. Thomas Moore, M.A.*†

20th December, 1855. SCIENTIFIC SECTION.

HENRY DAWSON, Esq., in the Chair.

The following gentlemen were duly elected Members of the Society:—

William Dobson, Esq., Chronicle Office, Preston.
George Grazebrook, Esq., 40, Canning Street.
The Rev. P. R. Robin, M.A., Barnston, Cheshire.
William Turner, Jun., Esq., Storeton House, Storeton, Cheshire.

The following Donations were laid upon the table:—

From the Society. Memoirs of the Literary and Philosophical Society of Manchester, vol. XI, (second series), 1854.

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* See Gentleman's Magazine for January, 1856.
† Transactions, p. 181.

From the Society. Sixteenth Annual Report of the Royal Botanical Society, 1855.

From the Mayor of Manchester. Third Annual Report to the Council of the City of Manchester, of the working of the Manchester Free Library.

From Thomas T. Wilkinson, F.R.A.S. The British Oracle; being dissertations on Philosophy and Mathematics, volume I, 1769. The Lady's and Gentleman's Diary for 1855.

From John Rooke, Esq., of Akehead, Wigton, Cumberland. Geology of the Lake District. Tables of Proportional Results of Variable sums of Bank Notes on the relative Price of Wheat.

Mr. Sansom exhibited a specimen of *Sphæria Robertsi* (Hook), a plant-shaped parasite of the caterpillar. Also *Hepialus Virescens* (Doubleday), a New Zealand moth.

Mr. Sansom also exhibited several Diagrams illustrative of his Paper.

Dr. Hume laid before the meeting a selection of thirty-two Medallions and Seals, from a large collection in the possession of Mr. James Coey. The collection, consisting of more than 500 in all, illustrates the Roman Emperors, the reign of Napoleon I, the Kings of France, the Kings and Queens of England, ancient Philosophers, and allegorical subjects.

Mr. Jacob exhibited a large Yataghan, the scabbard being silver, and the hilt ivory inlaid with silver. The blade was of pure Damascus work.

The following Papers were then read:—

On a Fungoid Disease affecting the Pear Tree. *By Thomas Sansom, Esq.*[*]

General Remarks on the Natural History of the Shores of the Mersey. *By Richard A. Tudor, Esq.*

The author entered into the general appearance of the marine zoology of the neighbourhood, giving notices of the habits of many of the species. The following are extracts:—

"A small cone-shaped tube is found in great abundance on the sands near to the last tide-mark, formed in the most symmetric and architectural manner by grains of sand. These are agglutinated together by a secretion from the animal's own body. The inhabitant is a worm, (*Pectinaria Belgica.*) In the living state, it is buried in the sand; we find only the empty tube. There are other tubes frequently met with, about eight or ten inches, with a fimbriated extremity, and covered with fragments of shell, and particles of sand agglutinated by a viscid secretion from the animal's body. This is also the habitation of a marine worm (*Terebella conchilega*), but it is generally buried in the sand, out of harm's way, sometimes penetrating to a great depth. These animals are commonly found midway between the tide-marks.

"Suddenly, in the direction of low water, may be observed something in appearance like a puff of black smoke, which, if watched, will be as instantly changed into a white sheet, and again altered, for a moment, so as to be quite unnoticeable. These appearances and changes are produced by a large flock of marine birds, called Purre (*Tringa Cinclus*); and the change in appearance is caused by either the back or breast feathers presenting themselves to the sun's light. This is effected in a wonderful manner by a simultaneous movement of the whole flock. Occasionally also may be seen the hooded crow (*Corvus cornix*), but only in the winter months. Not more than two or three at a time, rarely more, may be seen, and sometimes a solitary bird. They are migratory, and generally arrive with the woodcock.

"During the summer months the attention of the visitor is directed to a peculiar ocular deception, produced by the refractive condition of the atmosphere. When the tide is out, he observes, looking north, a mile or two distant, a very interesting panorama; the objects being much confused, and appearing as if in a glassy lake,

[*] Transactions, p. 193.

when in fact they are on dry ground. This deception is produced by the heat of the sun, exhausting the moisture from the sands, and forming quite a mirage. This frequently takes place in the sandy deserts of Arabia, deceiving the traveller when parched with thirst.

"In many patches, nearer to high water mark, on the shore, may be observed millions of worm casts. These are produced by the lob or lug-worm A few inches from the cast may invariably be seen a round hole, through which the animal came and fed while the tide covered the surface; and the cast is deposited after the nutritious portions have been extracted. These creatures are very much sought for by fishermen, and when first taken, they display the prismatic colours very beautifully by their movements. The rings of the head of this animal are very peculiarly constructed, forming a regular cone, which it has the power of drawing in and extending as circumstances require. In these localities the ripple marks, formed by the recent action of the water, present very beautiful appearances, and the shade produced by the varying altitude of the sun cannot but attract the attention of the observer. They partake of great similarity in shape and character.

"On the sands at Little Brighton is found, in abundance, one of the beautiful tribe of beetles, (the *Cicindela hybrida*,) at all times welcome to the collector.

"On the surface of the loose sands, appearing as a dark powder, will be found *Iserine*, a semi-metallic substance. It is also found on the Cheshire side of the Mersey, and is highly magnetic. The lens being at hand, it is interesting to examine a few pinches of the dry sand, by transmitted light, on a little window glass."

3rd January, 1856. ARCHÆOLOGICAL SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The following gentlemen were duly elected Members of the Society:—

Thomas Bouch, Esq., 1, Oldhall Street.
Thomas A. Welton, F.S.S., 147, Fenchurch Street, London.
The Rev. Thomas Staniforth, Storrs, Windermere.

The following Donations were laid upon the table:—

From the Society. Report presented to the Cambridge Antiquarian Society, at its 15th General Meeting, May 14th, 1855.

From the Society. Proceedings and Transactions of the Kilkenny Archæological Society, for May July and September, 1855.

From the Rev. J. S. Howson, M.A. First Annual Report of the Government School of Art, in connexion with the Collegiate Institution, Liverpool, 1856.

From the Society. Proceedings of the Numismatic Society, Session 1853-54.

From the Archæological Institute. The Archæological Journal for Sept., 1855.

From the Society. Annual Report, and Selection of Papers read before the Literary and Philosophical Society of Leicester since its formation, 1855.

From la Société Archæologique de l' Orleanais. Etude sur la Roman de la Rose par M. P. Huot, et Rapport par M. Mange du Bois des Entes, 1853.

From the Author. Rapport sur les Fouilles pratiquées en Village de Vieux, pendant les annees 1852, '53, '54, par M. A. Charma.

From C. R. Smith, Esq. Discours prononcé a la Seance publique, du 20 Aout 1852; par M. J. Garnier, Directeur.

From Lord Londesborough. Miscellanea Graphica, No. 7.

From Henry Johnson, Esq. An Act of Parliament *temp.* George II. (1754), for making navigable the river called Sankey Brook, and for adjusting the measure of coal brought down the said Brook, and sold within the town of Liverpool.

From the Rev. T. B. Ingham. A Sacred Poem, by W. Colton, Esq., B.A.

Dr. Hume exhibited three ancient parchments, relating to families and property in Cheshire and Flintshire. They formed part of a collection of similar documents, 59 in number, in his possession.

Mr. Mayer exhibited a gold torque and seven armillae recently found in Ireland. They were all of solid gold, and nearly pure. They were part of a "find," the value of which in gold only, was estimated at £1,200.

The Rev. W. B. Grenside exhibited a silver spoon and four coins, recently found near Thurland Castle, Lancashire; together with numerous gold and silver coins of the periods of the Edwards and Henries. Mr. Grenside also exhibited several rare and interesting medals in silver and bronze.

The first portion of the following Paper was then read:—

ON THE STATE OF THE WESTERN PORTION OF THE ANCIENT KINGDOM OF NORTHUMBERLAND, DOWN TO THE PERIOD OF THE NORMAN CONQUEST. *By John Hodgson Hinde, Esq.**

10*th January*, 1856. LITERARY SECTION.

J. T. DANSON, ESQ., V.P., in the Chair.

The following Donations were laid upon the table:—

From the Royal Asiatic Society. Journal of the Society, vol. xi. part 1, 1849; vol. xii. pts. 1 and 2, 1849, '50; vol. xiii. pts. 1 and 2, 1851, '52; vol. xiv. pt. 1, 1851; vol. xv. pts. 1 and 2, 1853, '55; vol. xvi. pt. 1, 1856.

A descriptive catalogue of the Historical MSS. in the Arabic and Persian languages, in the Library of the Royal Asiatic Society; compiled by W. H. Morley, M.R.A.S., 1854.

Essay on the Architecture of the Hindus, by Rám Ráz, native judge in India, 4to., with 48 plates, 1834.

Vestiges of Assyria, being three large coloured maps, exhibiting (1) the Remains of Ancient Nineveh, and the site of the modern Mosul; (2) Plans of Nimroud and Selamiyeh; (3) the country included in the angle formed by the rivers Tigris and Upper Zab.

From J. T. Danson, Esq. Five Letters on Tenant Farming.

From George F. Wilson, F.R.S. New Process for obtaining Glycerine.

Mr. Mayer exhibited on behalf of Dr. Bell, of London, an early edition of Reynard the Fox, copiously illustrated with quaint woodcuts, and printed in the Low German dialect, in 1660.

Mr. Sansom laid before the meeting a series of 28 photographs, the property of J. P. G. Smith, Esq. They represented various edifices, and views in the interior of Sebastopol. The most remarkable were a large view of the Church of St. Peter and St. Paul, the interior of the Malakhoff and Redan, the Docks, Barracks, &c. The whole were executed by Robertson of Constantinople.

* Transactions, p. 1.

Mr. Jacob exhibited at the same time, the helmet and sword of a Russian soldier killed in the attack upon the Redan.

Mr. Marsh exhibited a stone celt or "toki" found among the Maöris of New Zealand.

Mr. Blackmore exhibited a medal, and made some inquiry respecting it, which had been sent by Mr. Lingard, of Eastham. It* was struck in 1689, on the flight of James II.

Mr. Percy M. Dove exhibited two MS. volumes of autograph letters, and copies of others, from distinguished persons, written during the last 70 or 80 years. Among them were several original letters from Dr. Franklin, Bloomfield, Rogers, Miss Edgeworth, &c.

In connexion with this subject, Mr. Bloxam exhibited a copy of "Cicero de Senectute," printed and published at Philadelphia, in 1754, by Benjamin Franklin.

The following Paper was then read:—

On Some Unpublished Letters of Dr. Franklin. *By Percy M. Dove, F.S.S., F.I.B.A.*

Mr. Dove laid before the Society two large volumes of Autograph Letters and Scraps, which had been the property of the late Benjamin Vaughan, Esq. They contained several original letters from Dr. Franklin, all of them illustrating the published biography of that eminent man, and confirming the high opinion which the public have already formed of him. They did not of themselves, however, contain matter of sufficient general interest, to require their publication.

The dates of the principal letters were October 4th, 1774; December 16th, 1774; May 5th, 1779; August 18th, 1788; and December 9th, 1788.

In connection with this subject, Mr. Dove furnished some information respecting the Vaughan family, with whom this literary correspondence had taken place. Benjamin, eminent as a scholar and philanthropist, was specially the friend of Franklin; and Priestley dedicated to him the first edition of his "Lectures on History." Some letters of his in the life of Bentham, gave rise to an inquiry respecting him from Miss Edgeworth, contained in the present collection. He was in Parliament for some time; and in the negociations for peace between Great Britain and the United States, he was trusted by both parties. He afterwards settled in America; and we are indebted to him for the admirable Autobiography of Franklin. This is acknowledged in the Life† itself; and is confirmed by the last of these letters of 9th December, 1788. Mr. Vaughan's publication of Franklin's "Political, Miscellaneous, and Philosophical Essays," in 1779, gave rise to a singular charge against Dr. Franklin, respecting the Parable on Persecution.‡ William Vaughan was a merchant in London, and the founder of the "London Provident Institution." He had turned his attention greatly to the subject of canals and docks, and is said to have written articles on those subjects for Rees's Encyclopædia. He was intimately connected with literature and science during the greater part of his life. He settled finally in Philadelphia, where he died. Another brother, the Hon. Samuel Vaughan, was Assistant Judge and Member of Assembly in Jamaica. All the members of the family were long lived, in accordance with the theory that the vitality is expended in some families from generation to generation at an early age, say 50 to 60, while in others the members are equally hale at from 80 to 90.

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* *Obverse.* The head of James with the inscription "Jacobus II. Britan. Rex. Fugitiv. *Reverse* An oak tree prostrated by the storm, and beside it an orange tree in full bearing. Around "Pro glandibus aurea poma," and below "Post fugam regis delata regni administratio Principi aureazian. 1689. S.N." See Pictorial History of England, vol. iv. p. 29, where the inscription is incorrectly given.

† "I am diligently employed in writing the History of my Life, to the doing of which the persuasions contained in your letter of January 31st, 1783, have not a little contributed."—*Franklin to Vaughan, October 24th*, 1788.

‡ This "is one of the most curious topics in literary history. It has often been made the foundation of a charge of plagiarism against Dr. Franklin, but as I think, without foundation. In its modern form, it was published by Lord Kaimes in 1774. He says 'it was communicated to me by Dr. Franklin, of Philadelphia,' but he does not say that Dr. Franklin claimed the authorship of it. It was, not long after, inserted in a small collection of Dr. Franklin's miscellaneous writings, published by Mr. B. Vaughan, (a gentleman recollected by Lord Lansdowne), in London. Mr. Vaughan took it from Lord Kaimes's work."—*Life of the Rev. Sydney Smith.*

17*th January*, 1856. SCIENTIFIC SECTION.

THE REV. DR. THOM, V. P., in the Chair.

The following Donations were laid upon the table:—

From the Geological Society (London). The Quarterly Journal of the Geological Society, vol. xi, 1855.

From the Geological Society (Dublin). Journal of the Society; vol. i, parts 2, 3, and 4 (1834–38); vol. iii (1844–48); vol. iv (1849-51); vol. v, (1851-53); vol. vi, parts 1 and 2 (1854–55).

From the Society. Proceedings of the Royal Society, vol. vii., No. 16.

From the Society. Proceedings of the Essex Archæological Society, vol. i. part 1.

From Mr. Heath. Explication des ouvrages de Peinture, Sculpture, &c., &c., des Artistes vivants, Estrangers et Français, au Palais des Beaux Arts. Paris, 1855.

An Essay on the Credibility of the Existence of the Kraken, Sea-serpent, and other Sea Monsters. By Edward Heath, Esq.

Dr. Hume laid on the table two objects relating to the Bridgewater family. (1) A medal, now rare, commemorative of Francis Henry, the last Earl of Bridgewater, whose name is associated with the Bridgewater Treatises. (2) A halfpenny of the date 1793, the obverse bearing the arms of the Duke of Bridgewater, and the motto—"Success to Navigation," alluding to the Bridgewater Canal; the reverse—the figure of a man carrying a burden, with the legend "Manchester Halfpenny."

Dr. Hume also directed attention to two interesting fragments of stone; the first a piece of sandstone, about three inches long, from near Delhi, which was perceptibly elastic to the touch; and the second, a sort of soapstone from North Wales, which the women of the locality are in the habit of eating in considerable quantities.

The second portion of the following paper was then read:—

ON THE STATE OF THE WESTERN PORTION OF THE ANCIENT KINGDOM OF NORTHUMBERLAND DOWN TO THE PERIOD OF THE NORMAN CONQUEST. *By John Hodgson Hinde, Esq.*

7*th February*, 1856. ARCHÆOLOGICAL SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The following Donations were laid upon the table:—

From la Societe Archæologique de l'Orleanais. Memoires, tome iii. 1855.

Bulletin de la Société, Nos. 1-15, (1851-53); Nos. 16-21, (1854-55)

From J. F. Marsh, Esq. Two plates for the illustration of his own paper.

It was also announced that a donation of four antique high-backed oak chairs, and a small oak table, had been made to the Society, for its Library, by Mr. T. J. Paris.

Mr. Danson exhibited a tobacco-box of tortoise shell, handsomely mounted with silver, and bearing the crest and initials of its original owner; as a specimen of the description of box commonly carried by gentlemen about the middle of the last century.

Mr. Grazebrook drew attention to the prospectus of a Roll of Cloyne of the 13th and 14th centuries, about to be published in fac-simile with illustrations.

Mr. Jacob laid upon the table the following, procured by our army in the East. A book of prayers in Greek, for the use of the modern Greek Church, during the month of April; Venice, 1818. A similar book for the month of September; no date. History and description of the City of Jerusalem and of the Holy Places, folio; Venice, 1728. A Russian square medallion, used as a religious charm, and worn on the person, subject the Virgin and Child.

Mr. G. R. Berry placed before the Society a volume of antiquarian gleanings in the north of England.

Dr. Thom drew attention to the subjects noticed in the following three volumes. A large declaration concerning the late tumults in Scotland, from their first originall; by the King. London, 1639. Recueil des Antiquités, Egyptiennes, Etrusques, Grecques et Romaines; Paris, 1752. A volume containing nine pamphlets, six of them of great local interest in Liverpool.

Mr. Marsh, in illustration of his paper for the evening, exhibited two drawings, viz., a view of the Grammar School, a shield of arms, &c; and a view of the master's house.

Mr. H. A. Bright exhibited an ancient and curious Sclavonic Prayer Book, taken at Kertch.

Mr. Bright exhibited a small green stone or perforated bead, with a white spiral snake curling round it. "The Welsh call these stones 'Glain Neidr,' or snake stones. They were worn by the different orders of bards, each having its appropriate colour; the blue belonging to the presiding bards, the white to the Druids, and the green to the Ovates. Those with the three colours blended were devoted to the use of the disciples. The notion of their rare virtues was universal in all places where the bardic religion was taught."

Mr. Bright drew attention to an autograph of the Empress Maria Theresa, written shortly before her death.

Dr. Hume placed before the meeting on the part of the Misses Cort, of Kirkby-in-Walton, four beautiful ivory carvings. The subjects were described as St. Dominic; the scourging of Christ; Hercules and Omphale; and St. Sebastian.

The following Paper was then read:—

ON THE FOUNDATION AND HISTORY OF BOTELER'S FREE GRAMMAR SCHOOL, AT WARRINGTON. *By John F. Marsh, Esq.**

14th February, 1856. LITERARY SECTION.

J. T. DANSON, Esq., V. P., in the Chair.

The following Donations were laid upon the table:—

From the Smithsonian Institution of the United States. Antiquities of Wisconsin, as surveyed and described by J. A. Lapham, C.E., for the American Antiquarian Society; 4to, Washington, 1855.

Eighth Annual Report of the Boards of Regents of the Smithsonian Institution; 8vo, 1855.

Ninth Annual Report of Ditto, 1855.

Appendix; Publications of Learned Societies and Periodicals in the Library of the Smithsonian Institution; part 1, to January 1st, 1855.

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* Transactions, p. 51.

From the Editor. A Few Answers to the Arguments put forward by the Speakers at the Great Meeting in St. George's Hall, January 20, 1856, in Defence of the Sabbath: extracted from the Liverpool Press. Liverpool and London. 8vo. 2 copies.

From Mr. Genn, presented through Mr. Burke. The Humourist; a Comedy, by Thomas Shadwell: London, 1671. Dedicated to the Duchess of Newcastle, and bearing the autograph of Henry Duke of Newcastle, 1676.

Dr. Hume drew the attention of the Society to some beautiful maps, which are in course of publication. They are accompanied by pictorial and ethnological illustrations; and the political dependencies are beautifully grouped, when possible, round their respective centres.

The following paper was then read, viz:—

"On the Area and Population of the Manchester District." *By J. T. Danson, Esq., V. P.**

21*st February*, 1856. SCIENTIFIC SECTION.

The Rev. Dr. Thom, V.P., in the Chair.

The following Donations were laid upon the table:—

From the Society. Transactions of the Ashmolean Society, vol. i (wanting parts 1 and 8, which are out of print); vol. ii.

From the British Association for the Advancement of Science. Twenty-fourth Annual Report—Liverpool Meeting. 1855.

From Mr. Thomas Gray. Statistics of South Australia, for 1854, compiled from authentic official records in the Colonial Secretary's office, Adelaide.

Mr. Sansom mentioned that the arrangement of the Society's Herbarium was progressing, and submitted for exhibition a series of the rarer plants possessed by the Society.

Mr. C. S. Gregson exhibited four cases of British Lepidoptera, in illustration of his paper for the evening.

Mr. Moore, of the Derby Museum, laid before the Society three pairs of horns, of the Chiru, (Antilope (Pantholops,) Hodgsonii, Abel,) the so-called "Unicorn" of Thibet; also a pair of horns of the Prong Horn Antelope, of North America; and another pair, presenting some remarkable points of difference. These were described shortly before, by Dr. Gray, of the British Museum, as those of the Antelocapra Anteflexa, from this specimen, the only one yet obtained.

Mr. Moore read the following remarks, explanatory of these specimens:

On a supposed new species of Prong-horned Antelope from North America. *By Mr. Thomas J. Moore, of the Derby Museum.*

The series of Mammalia in the Derby Museum, contains the head and horns of the remarkable Cabrit or Prong-horn Antelope of North America, and also a pair of horns similar in general character, but bent in an exactly opposite direction. I placed them in the hands of Dr. Gray of the British Museum; and after due consideration, they

* Transactions, p. 165.

were described by him before the Zoological Society of London, as a probable new species, under the name of *Antilocapra anteflexa*. As Dr. Gray's description is attached to the specimen now exhibited, it is unnecessary to repeat it here. I am in possession of no other information respecting it except a fact which I learned after placing the horns in Dr. Gray's hands, and that is, that both pairs of horns were obtained by Mr. Burke in North-West America, but in what exact locality was not stated. The common species ranges from 53° North to the plains of Mexico and California, and is found in considerable numbers on the banks of the Colombia and Saskatchewan rivers.

. ON THE HORNS OF THE CHIRU, (*Antilope* (*Pantholops*) *Hodgsonii*, Abel), THE SO-CALLED UNICORN OF THIBET. *By Mr. Thomas J. Moore.*

The reader of Huc's Travels in Tartary and Thibet is not a little astonished at the author's assertion, towards the close of his narrative, in recounting his return from Lha-Ssa, the capital of Thibet, of the veritable existence of the Unicorn. He says, "On the fourth day of our departure from Ghiamda, after having crossed a great lake on the ice, we stopped at the Station Atdza, a small village, the inhabitants of which cultivate a few acres of land, in a little valley encircled by mountains, the tops of which are covered with hollies and pines. The Chinese itinerary says, on the subject of the lake you see before your arrival at Atdza, 'The unicorn, a very curious animal, is found in the vicinity of this lake.'" M. Huc then goes on to say, "The unicorn, which has long been regarded as a fabulous creature, really exists in Thibet. You find it frequently represented in the sculptures and paintings of the Buddhic temples. Even in China you often see it in the landscapes that ornament the inns of the northern provinces. The inhabitants of Atdza spoke of it without attaching to it any greater importance than to the other species of Antelopes which abound in their mountains. We have not been fortunate enough to see the unicorn during our travels in Upper Asia. But all we were there told about it, serves to confirm the curious details which M. Klaproth has published on this subject in the new '*Journal Asiatique*,' and who states 'The unicorn of Thibet is called in the language of this country, *Serou*.'" After some further desultory remarks, M. Huc goes on to say "Mr. Hodgson, an English resident in Nepaul, has at length achieved the possession of a unicorn, and has put beyond doubt the question relative to the existence of this species of antelope, called '*tchirou*,' in Southern Thibet, which borders on Nepaul. It is the same word with *serou*, only pronounced differently, according to the varying dialects of the North and of the South." Dr. Abel has proposed to give to the tchirou the systematic name of *Antilope Hodgsonii*, after the name of the learned person who has placed its existence beyond a doubt.* Unfortunately M. Huc does not inform his readers that the antelope in question is possessed of a pair of horns like other antelopes, and that the so-called unicorns are at the most only such as have broken one off at the root by fighting!

Dr. William Hooker, in his "Himalayan Journals," vol. ii, pp. 157–8, gives a sketch of the head and horns in profile, and also a front view of the Chiru, and states that "The accompanying figures of the heads of the Chiru (*Antilope Hodgsonii*) were sketched by Lieut. Maxwell (of the Bengal Artillery) from a pair brought to Dorjiling; it is the so-called unicorn of Thibet, and of MM. Huc and Gabet's narrative,"—a name which the Doctor thinks the profile no doubt suggested. Dr. Hooker saw them feeding on the short grass about the Cholamoo Lakes, which are 17,000 feet above the sea, in company with another antelope (the *Procapra picticauda*), Hares, (*Lepus oiostolus*), Marmots, and tail-less Hares (*Lagomys*).

The only specimens of this animal which have reached England, are a male in the British Museum, a specimen in the East India Company's Museum, and a male and female formerly in that of the Zoological Society. These, and a few horns in the same museums, are the only remains of this rare species that have been imported, and have been chiefly obtained by B. H. Hodgson, Esq., the late British Resident at the Court of Nepaul, (mentioned above), to whose zeal is due most of the information obtained on the subject, and to whom zoologists are almost entirely indebted for their knowledge of the natural history of that country, and the discovery of some hundreds of new species of quadrupeds and birds.

* From the Illustrated Edition of Huc's Travels in Tartary, &c., translated by Wm. Hazlitt, forming part of the National Illustrated Library, London, 185-. Vol. 2, pp. 244-248.

Such being the rarity of the Chiru, it is with great pleasure that I am enabled to exhibit to the meeting three pairs of horns, two of which were purchased, and one pair, with the chief part of the cranium attached, presented by the East India Company in their recent magnificent donation to the Free Public Museum. This pair was forwarded to the Company by Mr. Hodgson himself; and the following extracts are from various Papers forwarded by him from time to time to the Zoological Society as he became acquainted with the characters and habits of the species, and printed in the Society's Proceedings.

This animal, the supposed unicorn of the Bhotians, was first described imperfectly by Dr. Abel (in the Edinburgh Journal of Science for 1827) from an injured skin, and the notes of Mr. Hodgson. Dr. Abel gave it the name of Antilope Hodgsonii; and it has subsequently been mentioned by M. Lesson as the *Antilope Chiru*, and by Major Hamilton Smith as the *Antilope Kemas*.

"In form the Chiru antelope approaches the deer. Its limbs are long and slender, but not weak; its neck is also rather elongated and slender; its head tapers forwards, but is somewhat deficient in elegance on account of the nasal tufts, and of a rather unusual quantity of hair and bristles about the mouth and nose. The ears and tail are moderate, and devoid of any peculiarity; so likewise are the suborbital sinuses. The horns are exceedingly long, measuring in some individuals nearly two feet and a half. They are placed very forward on the head, and may be popularly said to be erect and straight, although properly speaking they bend forwards and outwards, and become suddenly incurved towards their tips. These latter are rather acute, and the horns near them become round; below they are laterally compressed, and are marked by a series of from fifteen to twenty rings, extending from the base to within six inches of the tip. On the lateral and dorsal surfaces of the horn these rings are little elevated, and present a wavy rather than a ridged appearance; but on the frontal surface, they exhibit a succession of heavy, large ridges, with furrows between.

"Close to the outer margin of either nostril is a soft, fleshy, or rather skinny tumour or tuft, about the size and shape of the half of a domestic fowl's egg. These tufts appear to be peculiar to the *Chiru*.

"In its double covering, the *Chiru* agrees with all the hairy animals of Thibet, where not merely the goats and sheep, but the dogs, horses, and kine, possess an under fleece of soft fine wool. The hair forming the external coat is about two inches long, and so closely set as to present to the touch an impression of solidity; it is straight, nearly erect, rather harsh, and feeble, being for the most part hollow like a quill. Grey blue is the general colour of the hair throughout nine-tenths of its extent from root to tip, as well as exclusively so of the wool beneath the hair. This radical and prevalent color is, however, but dimly seen through the external or superficial hues with which it is overlaid; hues which on the upper parts of the animal are fawn red, and on its under surface and the inside of its limbs are white. The shoulders are faintly marked by a tracing of color lighter than that of the surrounding parts. Down the front of all the legs runs a black line, reaching to the hoofs on the fore-legs, but to the knees only on the hind legs. The forehead is perfectly black, and a fringe of the same hue proceeding from the bottom of the frontal skin passes round the outsides of the nasal tufts. These tufts, as well as the rim surrounding them, are black; as are also the bristles of the mouth and lips; the few hairs, however, which depend from the lower lip are white.

"Entire length of a fully grown young male 4 feet 2½ inches—height at shoulder 2 feet 8 inches.

"The Chiru is highly gregarious, being usually found in herds of several scores and even hundreds. It is extremely wild, and unapproachable by man, to avoid whom it relies chiefly on its wariness and speed; but though shy it is not timid, for if overtaken it meets danger with a gallant bearing. An individual which was kept alive at the Presidency, though captured very young, was perfectly fearless, and could only be approached with caution. It is said by some to inhabit the plains of Thibet generally; while according to others it is confined to those plains which are within sight of mountains, especially of the Hemâchal mountains. It cannot bear even the moderate heats of the valley of Nepal, an individual belonging to the Lama of Digurchee having

died at the commencement of the hot season, when the maximum of temperature was only 80°, a temperature seldom reached for two hours a day, or for two days of that month, March.

"The Chiru is extremely addicted to the use of salt in the summer months, when vast herds are often seen at some of the rock-salt beds which so much abound in Thibet. They are said to advance under the conduct of a leader, and to post sentinels around the beds before they attempt to feed."—*Hodgson in Proc. Zool. Soc. Lond.* 1831, p. 52.

The nasal tumours which form so remarkable a peculiarity of the species, are stated by Mr. Hodgson, in a subsequent paper, "to consist of fine elastic skin and cartilage, similarly to the nostrils, immediately behind the posterior boundary of which they are situated, and into which they open freely, being, in fact, a prolongation backwards, and accessory dilatation of that reflection of the skin which lines the nostrils. Externally they present a round, firm, elastic swelling on each lip, well defined, and covered with hair like the adjoining parts; internally they constitute a sac, of capacity to contain a marble, lined with the same skin that lines the nostrils, and not communicating with the interior of the nose except by and through the ordinary nostrils, into which the sacs open forwards by a slit that will admit the finger to be passed into it; and thence all over the interior of the sac. These sacs are usually defiled with *mucus*, secreted from the nose; and they seem to be nothing more than supplementary nostrils, designed to assist this exceedingly fleet animal in breathing when he is exerting all his speed, for the expansion of the nostrils opens them also, and their elasticity allows of their being dilated in the manner of the nostrils. There is no appearance, either external or on the bones of the face, of the lachrymal sinuses." *Id.* 1833. p. 110.

"The female is hornless, and has two teats only; she has no marks on the face or limbs, and is rather smaller than the male. The male has a large pouch at each groin, as in the Dorcas Gazelle; that of the female is considerably smaller." In conclusion, Mr. Hodgson's opinion as to the position of the species in the system is, that "The Chiru with his bluff bristly nose, his intermaxillary pouches, and hollow-cored horns," (the bony core of the horns having a large oval cavity, communicating by one clean canal with the frontal sinuses) "stands in some respects alone," and hence Mr. Hodgson is disposed to suggest, that it should be regarded as representing "a new subgenus, to be termed *Pantholops*, the vulgar old name of the Unicorn.—The habits and manners of the *Chiru*, his medial size, and his elegant vigorous form, ally him most to the *Antilopine* and *Gazelline* groups, and equally to both." (*Id.* 1834, pp. 80-81.) This opinion is shared by Dr. Gray, who, in his last published arrangement of the Ruminantia, (List of Ungulata Furcipeda in British Museum, 1852,) places the Chiru in the same subdivision as the Gazelles; under the amended title of *Pantholops Hodgsonii*.

Colonel Hamilton Smith remarks, "The species might still have remained unnoticed in the elevated wildernesses of Central Asia, if the people of the country had not asserted it to be the Unicorn, and since the specimen is produced, insisted that it is often found with only one horn. No doubt all the" Antelopes of this group "are liable to break one of their horns, when we consider their length, small diameter, and the vigour and courageous disposition of the animals." *Griffith's Cuvier*, 4, p. 198.

The following papers were then read:

ON THE LEPIDOPTEROUS INSECTS OF THE DISTRICT AROUND LIVERPOOL. *By Charles Stuart Gregson, Esq.**

ON THE ADVANTAGES OF THE STUDY OF NATURAL HISTORY, IN OUR NATIONAL OR PEOPLE'S SCHOOLS. *By Charles Stuart Gregson.*

The introduction of Natural History more fully and formally into our National Schools, was strongly advocated; though the writer gladly admitted that the principle

* Transactions, p. 153; continued from Transactions vii, p. 254.

had been already recognised in part; and he noticed several school treatises on the subject. His opinion was that ordinary schoolmasters and pupil teachers might easily be instructed in the principal branches of Natural History, so far as to initiate their pupils, and to enable them to prosecute individual departments with success, when taste and opportunity existed. Besides securing the young against the formation of vicious habits, such studies would add materially to their enjoyments, and might lead to still higher results in pointing them "from Nature up to Nature's God." But in a utilitarian age, it was of great importance to be able to shew that an acquaintance with natural products, animal vegetable and mineral, was useful to the man of business; and this the writer did by reviewing the daily occurrences in some of the ordinary occupations of life.

6th March, 1856. ARCHÆOLOGICAL SECTION.

The Rev. Dr. Thom, V.P., in the Chair.

Mr. Robert Daw, F.B.S.E., Comptroller of the Customs at Liverpool, and Mr. Charles Hardwick, of Preston, were duly elected Members of the Society.

The following Donations were laid upon the table:—

From Gilbert J. French, Esq. Bibliotheca Albinsoniana, a Book Catalogue.

From the Society. Quarterly Journal of the Geological Society, volume xii, part 1.

From the Author. Sigilla Ecclesiæ Hibernicae Illustrata, by Richard Caulfield, B.A., parts 1 and 2.

From the Author. The Provident Institutions of the Working Classes; and Provident Institutions of the Working Classes, their Precarious Financial Condition; two tracts, by Charles Hardwick, Esq.

From the Editors. Two copies of a Paper entitled "Sabbath Defence," containing the Report of a Public Meeting in defence of the Sabbath, held at St. George's Hall, 22nd January, 1856.

From Thomas Moore, Sen., Esq. Report on the present state of the Navigation of the River Mersey, by George Evans, Capt. R.N., Acting Conservator, 1856.

From William Kelly, Esq., Leicester. Three Wood Engravings, representing respectively—Fragment of a Roman Pavement, Roman Milestone imperfect, and Roman Milestone restored.

From Dr. Kendrick. Various cuttings and slips, being cuttings of local Notes and Queries from the *Warrington Guardian*.

From Dr. Thom. Printed Report of a Meeting of the Leicestershire Architectural and Archæological Society, September 18th, 1855.

From Mr. Dunkin, of Dartford. The Archæological Mine and New History of Kent, parts i–xx, also parts xxi, xxii, and Supplement.

From Mr. H. Ecroyd Smith. Roman Tesselated Pavements, Nos. 1, 2, and 3, from the grounds of Andrew Lawson, Esq., of Aldborough, Yorkshire.

Tesselated Pavement discovered in Jury Wall Street, Leicester, in 1830; and another from the same town, discovered in High Cross Street, 1675.

Mr. Blackmore exhibited and explained four stone celts and two bronze spear heads. Of the former, two were found near Galway, one at Backton, in Cumberland, and one in New Zealand. Of the latter, the more perfect specimen was discovered in 1851, in a bog at Leenane, Connemara, about six feet from the surface.

Mr. Blackmore also drew attention to the formation of Irish pearls, and showed two from beside Oughterarde, with the mussel shells in which they were found. He also laid before the meeting two coins, one of Nero, found in cutting the canal from Lough Corrib to Galway Bay; and two echini of unusual size and thickness, from the oyster beds on the coast of the County Clare.

Dr. Kendrick exhibited to the members an autograph letter of Linnæus, which had been addressed to Mrs. Anne Blackburne, of Orford, Warrington. It was dated Upsal, 24th July, 1771. A printed translation of it was read.

Mr. Boult made some inquiries respecting localities on the estuary of the Mersey, and showed the manner in which they were laid down in a Chart which he exhibited. Its title is "A Description of the Sea Coast of England and Wales, from Black-comb in Cumberland, to the Point of Linus in Anglesea, shewing the true situation of all the Headlands, Bays Roads, Harbours, Rivers, Creeks, Islands, Sands, Shoals, Depths of Water, Settings and Flowings of the Tides, Places where the Buoys, Beacons, &c. are fixed, with proper directions to avoid all dangers, and sail into any Harbour, Bay, Road, &c. on the said coast. Also many prospects of the same, correctly engraven on Copper Plates, in the charts belonging to this work; with remarks on, and references to them in a new and useful manner. According to an actual survey thereof made in the years 1736 and 1737, By Samuel Fearon and John Eyes, Liverpool: Printed by Adam Sadler, for the Authors, 1738."

[On the Chart of Liverpool Bay is a memorandum as follows:—"This new survey was taken and published in December 1755 as the act directs by John Eyes:" and "The plates altered by Jeremiah Evans Liverpool."]

Mr. Stonehouse exhibited water-colour drawings of various points in the neighbourhood, dated 1821; also a coloured engraving representing Liverpool from the Rock Perch in 1797. It was stated that several drawings are in circulation, copied from Herdman and others, but incorrectly represented to be original.

Mr. Lidderdale exhibited some works of the 17th century on Astrology and Palmistry.

Mr. Grazebrook showed a curious padlock made from a cannon ball, supposed to have belonged to the Spanish Armada.

Mr. Boardman exhibited, in illustration of his Paper to be read, a steel tobacco-box of the middle of last century; a set of Prince-of-Wales buttons, manufactured and worn in 1762; an early umbrella, of about 1770; and a peculiar walking stick of the same date.

The Secretary announced, that the next Meeting of the Society would be held in the Grand Jury Room, which would be fitted up specially for the occasion. A Paper by Dr. Julius Oppert, of Paris, would be read; and on that occasion the attendance of ladies was invited.

A letter was read from Sir Philip Grey Egerton, Bart., dated February 18th, 1856, correcting some statements in Mr. Stonehouse's Paper on the Parish and Church of Over, in Cheshire.* The expressions criticised were the following:—

1. *Mr. Stonehouse.*—"Oulton park and demesne were their [the Starkies'] property."

Sir P. Egerton.—"Now Oulton park and demesne are not in the parish of Over, but in the parish of Little Budworth, in which parish, to the best of my belief, the Starkies never possessed a single acre. They belonged to the Dones, who purchased them from the Rechetons, *temp* Edward IV, and came into the possession of my family, by the marriage of Elizabeth, heiress of Hugh Done, with John Egerton, who died 1st Richard III."

2. *Mr. Stonehouse.*—"At Hugh Starkie's death in 1555, the estates [viz., Darley] came into possession of Oliver Starkey, an illegitimate son.... He dying without issue, the estates descended to his brother James."

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* Vol. vii. p. 35*.

Sir P. Egerton.—"No authority is given for this statement. As far as I have been able to ascertain, I do not believe that the estates were vested in Oliver, but that on the death of Hugh Starkie without legitimate issue, they passed to his brother James."

3. Mr. *Stonehouse.*—"Either by litigation, or from other causes, the property passed into the hands of the Egertons."

Sir P. Egerton.—"I am aware that this passage, and many others in the paper, are borrowed from Ormerod; but in so gigantic a labour as the compilation of a History of Cheshire, it cannot be otherwise than that inaccuracies must occur, and they are very frequent in all that relates to my family, in consequence, I believe, of the author not having had access to the documents containing the information he required. The ambiguity of expression in the passage quoted, proves that he knew nothing about the matter; and would, I should have imagined, have deterred any other from selecting such a passage for repetition. The facts are, that the Starkie estates came into the possession of the Egertons of Oulton, by regular sales and conveyance, from Henry Starkie to Sir Philip Egerton, Knt., in the reign of Charles II, as shown by deeds and documents in my possession."

Sir Philip forwarded with his remarks a tracing of a scrap of a Starkie pedigree, written apparently in 1695. It brings the family one generation lower than Ormerod's pedigree.

The following Paper was then read:—

TABLE TALK OF THE OLDEN TIME; OR, LIVERPOOL A HUNDRED YEARS AGO. *By James Boardman, Esq.**

13th March, 1856. MISCELLANEOUS MEETING.

J. T. DANSON, F.S.S., V.P., in the Chair.

The Chairman, on announcing that the meeting was constituted, expressed on behalf of the Society, the pleasure which the members felt in welcoming ladies to one of their ordinary meetings. Special arrangements had been made for the purpose, and he hoped that the proceedings would be of a character to produce favourable and useful impressions. The order of business would be followed just as usual, so as to give a perfectly correct impression of the Society's mode of proceeding.

The following Donations were laid upon the table:—

From the Society. Memoirs of the Literary and Philosophical Society of Manchester, second series, vols. II, III, IV, V, VII, (in two parts), VIII.

From Lord Londesborough. Miscellanea Graphica, No. 8.

From the Author. Manual of British Botany, by Charles Cardale Babington, M.A., F.R.S., F.G.S., third edition, 1851.

From the Author. An Account of the Presents received, and Expenses incurred, at the Wedding of Richard Polsted, of Albury, Esquire, and Elizabeth More, eldest daughter of William More, of Loseley, Esquire, in 1557, by John Evans, Esq., F.S.A., 1855. From the Archæologia, vol. XXXVI.

From the Author. Duplicate copy of Geology of the Lake District, by John Rooke, Esq, of Akehead, Wigton, Cumberland.

From the Rev. Dr. Thom. Nos. 10 and 14 of the Rambler, a Liverpool periodical.

Mr. Boardman exhibited a lady's work-box, inside of which was an inscription,

* This paper has already been published, and is sold in pamphlet form.

stating that the cover of it was worked by Dorothy Peake, grand-daughter of the Rev. Charles Herle, Prolocutor of the Westminster Assembly of Divines in 1643. He was Rector of Winwick from 1626 to 1662, when he was ejected for nonconformity.

A large number of illustrations of Assyrian and Babylonian objects were lent by the Rev. Dr. Baylee, of Birkenhead, and formed part of an interesting display on one side of the room.

Dr. Hume called attention to a paragraph in *L'Abbevillois*, a French newspaper of 7th March, 1856, in which Mr. Roach Smith's Museum of Antiquities is noticed. The writer mentions that as it is interesting for the history of France, almost as much as for that of England, its purchase by the French Government would be desirable, or by one of the great towns of the Departments.

The following Paper was then read:—

ON BABYLON, AND ON THE DISCOVERY OF THE CUNEIFORM CHARACTERS AND THE MODE OF INTERPRETING THEM. *By Dr. Julius Oppert, of Paris.**

3rd April, 1856. ARCHÆOLOGICAL SECTION.

PETER MACINTYRE, M.D., in the Chair.

The following gentlemen were duly elected Members of the Society:—

The Venerable Archdeacon Jones, M.A., Waterloo.
Joseph Hibbert, Esq., Brook Bank, Hyde, Cheshire.

John Pemberton Heywood, Esq., late High Sheriff of Lancashire, having signified his wish to continue in the Society, was enrolled without election or entrance fee, in accordance with Law xiii.

The following donations were laid upon the table:—

From the Society. Memoires de la Société Archæologique de Normandie, vol. x, part 4, (second series,) 4to, Paris, 1855.

Do., vol. i, (third series,) 4to, Paris, 1855.

From the Society. Transactions of the Ossianic Society, vol. i. The Battle of Gabhra, 1854.

From the Society. Bulletin de la Société Archæologique d'Orleanais, No. 22, 1855.

From the Society. Original Papers published under the direction of the Committee of the Norfolk and Norwich Archæological Society, vol. v, part 1, 1856.

From the Cambrian Archæological Association. Archæologia Cambrensis, No. 5, (third series) January, 1856.

From the Author. The History of Leicester, from the time of the Romans to the end of the 17th century. By James Thompson, Leicester, 1849.

From Edward Heath, Esq. Local pamphlets, containing the following:—

Annual Reports of the Liverpool Ragged School Union, 1st, 2nd, 3rd, 4th, 6th, and 8th.
Annual Reports of the Liverpool Industrial Ragged Schools, Soho Street, 1st, 3rd, 4th, 5th, 6th, and 7th.
Report of the Police Establishment, &c., 1854.
Financial Reform Tracts, (new series,) vii, viii, ix, xi, xiii, (1854, '55, '56.)
Liverpool and its Educational wants, by James Gillespie.

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* Transactions, p. 93.

Report of the Liverpool Borough Prison, 1852.
Report of the Proceedings at a Special Meeting of the Liverpool Chamber of Commerce, on the Law of Partnership, 1854.
Ritchie's Address on Ragged Schools, to Young Men's Society, 1851.
History of the origin of Ragged Schools, 1848.

From Thos. B. Ryder, Esq. Journal of the Manchester and Liverpool Agricultural Society, 1856.

From the Rev. W. B. Grenside, B.A. Two drawings of the Market House, Town Hall, Stone Stocks, and base of the parish Cross, Hornby, Lancashire, made previous to their removal in 1851.

From Mr. Hermann. Two Lectures, by the Rev. Mr. Hart, on the History and Antiquities of Nantwich.

From Dr. Hume. Proof impression of a Portrait of Mr. Mayer, Honorary Curator, engraved by LeKeux, from a photograph.

From Charles Hardwick, Esq. Observations on the rate of Mortality and Sickness existing among Friendly Societies; by Henry Ratcliff, 1850. Appendix to do., 1852.

From Alfred J. Dunkin, Esq. Archæological Mine and History of Kent, Parts xxv, xxvi, xxvii.

From Dr. Kendrick. Two slips of Notes and Queries, from the *Warrington Guardian*.

From Alderman Brown, Preston. Portion of the upper stone of a Quern, obtained among the Roman Remains at Walton-le-Dale, Preston. Two fragments of Samian Ware, and neck of an amphora, from do.

From Charles Hardwick, Esq. Roman Remains, from Walton-le-Dale, consisting of the following:—

Portion of the neck, handle, and sides of a large Roman amphora.
Portion of a flat tile, with flange.
Four balls of prepared clay, as used at the potteries.
Nine pieces of red Samian ware.
Seven pieces of dark ornamented pottery.
Three do. of white do., one of them the bottom of a mortarium, with quartz inserted to aid the friction.
Neck and three fragments of an ordinary red vessel.
Two molar teeth, and part of the jaw of a horse, found in connexion with the remains.
Two large iron nails, portion of a pewter vessel, and a piece of sheet lead.

In illustration of his paper, to be read, Mr. Hardwick exhibited a large number of objects, including the following:—Enlarged map of the locality, including the township of Fishwick, and part of the parish of Walton; three drawings from the more interesting figures exhibited on the Samian ware; drawing of Roman pottery of various kinds; drawings of numerous objects of interest in stone and metal; portions of a Roman quern; fragments of Roman pottery: Roman coins, various; part of a fibula, with ornaments in blue enamel; portion of a fine fibula, with red stone setting; &c., &c., as described in the paper.

The Rev. W. B. Grenside, B.A., exhibited a beautiful sword, dug up in Sherwood Forest, about 75 years ago, and formerly the property of Major Hayman Rooke. The hilt presented a specimen of elegant ivory carving.

Mr. Grenside also exhibited a portion of a silver fibula, with curious inscription on both sides. It was dug up at the Roman Station of Bremetonacæ, about three miles from Kirkby Lonsdale.

The Secretary announced that the Honorary Curator, Mr. Mayer, had offered to place

his valuable collection, illustrative of Archæology, Ethnology, and the Fine Arts, in the keeping of the Town Council, during pleasure; provided the Library and Museum Committee could find suitable accommodation for it.

The following Papers were then read:—

ON THE ROMAN REMAINS RECENTLY DISCOVERED AT WALTON-LE-DALE, NEAR PRESTON. *By Charles Hardwick, Esq.* *

MONUMENTAL BRASSES FOUND AT PRESTON. *By William Dobson, Esq.*

A few months ago, as a brass-founder (Mr. W. Holland) in Preston was turning over a heap of old brass, with a view of transferring it to the melting pot, one piece having an antiquated look, and bearing upon it some marks, attracted his attention. He rescued it from its impending fate, and laid it aside. I obtained it from him, and after a little cleaning, easily deciphered the following inscription in plain Roman capitals, of which a rubbing is submitted:—

HERE · LYETH · INTERD · SEATH · BVSHELL · WOOLLEN · DRAPER BAYLIFE · AND · A · BROTHER · OF · PRESTON · DYING . THE · XV · OF SEPR · 1623 · AGED · 53 · GAVE · VNTO · HIS · KINESFOOLKES · AND · GOD CHILDREN · IN · LEGACIES · VI · C · L† · ALSO · XX · L‡ . TO · THE · POORE OF · THIS · TOWNE · FOR · EVER · THE · VSE‖ · TO · BE · GIVEN · THE . SAID POORE · BY · THE · MAIOR · OR · HIS · DEPVTIE · AT · CHRISTs · & · EASTER 4 · L · TO · THE · POORE · OF · LEELAND · & · WALTON · AL · OVT · OF · HIS CHARITABLE · MINDE

The "Seath Bushell" whose benevolence is thus recorded, was buried within the Parish Church of Preston, and his interment is recorded in the parish register, next to one dated the 16th of September, 1623, as follows:—Sep. [sepultus, buried] Mr. Seth Bushell, eo: die [the same day.] He was, as stated in the inscription, a "brother of Preston," i.e., a member of the corporation, his signature as "Seathe Bushell" being affixed to some proceedings of that body in the corporation records, in the year 1612. After possessing myself of this plate, which Mr. Holland kindly placed in my hands, with a view to its restoration to the church, I made some enquiries as to the site of Mr. Bushell's grave, and felt anxious to obtain some particulars of one who had shewn such a desire to benefit not only his "kinesfoolkes," but the poor of his town and neighbourhood. I learned that when the works in connection with the rebuilding of our Parish Church were in progress (in 1854 and 1855), the workmen were told that if they met with any plates (meaning, no doubt, ordinary coffin plates) they were to bury them. Yet even an ancient coffin plate might have possessed some local, personal, or historical interest. It would have been wiser to have ordered that all should have been submitted to some one in authority, who might have examined them. The workman who met with this plate, which was affixed to a gravestone about two feet below the then level of the church floor, knew that if a brass plate was of so little importance to a churchwarden, it would at least be worth something to a marine store dealer; so he got it removed and sold for old brass. In the progress of the work another workman met with a second brass upon the same gravestone, and this being disclosed in the presence of the parish sexton, some trouble was taken to obtain the former plate also, but of course without success. An inscription, "Spes altera vitæ" [*sic*], cut in rude old English characters, was above the plates on the gravestone. When I made enquiries (in December last) a few months after the discovery, not a vestige of the stone could be found. It had been destroyed in the course of the work, but fortunately Mr. John Addison, of this town, who saw it soon after its discovery, had taken a rubbing of it, from which this copy has been made.

The two brasses are of equal size, nineteen inches by nine; the one discovered last was placed lengthwise on the stone, with the other one crosswise below it. The former

* Transactions, p. 127.
† £600. ‡ £20. ‖ Interest.

bears a rude representation of a person wearing a robe, probably a municipal robe of that era; for our councillors then wore gowns, and rules respecting their attire are in our corporation records. There is also the broad turned down collar seen in portraits of that date. Mr. Bushell, for I deem it to be intended for his effigies, has the close cut hair of the Roundhead of that age, as well as the moustache and "beard of formal cut" clearly defined.

Of his family connections I can give no authentic information. From the extent of his bequests to his "kinesfoolkes and god-children" I presume he was childless. A Seth Bushell, probably his nephew, was vicar of Preston. His signature as "Seth Bushell, D.D., and Vicar of Preston," appears several times in the minute book of the Select Vestry of the Parish, between 1671 and 1674. He was afterwards (1682-84) Vicar of Lancaster. It is not improbable that Dr. William Bushell, the benevolent founder of Goosnargh Hospital, near Preston, was of the same family. As respects the benefactions to the poor, recorded in the inscription, I can give no information. The Reports of the Charity Commissioners say nothing about any of them, and the records of our corporation are silent as to any legacy to this town, although they contain notices of other charities. Like many others they have, in the lapse of ages, been lost sight of, or diverted from their original destination.

Notwithstanding the rudeness of these brasses, as works of art, the scarcity of such monumental records in the northern and western counties, and the benevolent intentions of the Lancashire worthy whom they were intended to commemorate, entitle them, I think, to a notice in the Transactions of the Lancashire and Cheshire Historic Society.

10*th April*, 1856. LITERARY SECTION.

THOMAS SANSOM, Esq., in the Chair.

The following Donations were laid upon the table.

From the Royal Irish Academy. Transactions of the Academy, vol. xxii, part 1, Science; part 2, Literature. Proceedings, vol. vi, part 2 (1854-55.)

From Edward Clibborn, Esq. An Essay on the Probability of Saul, Benish, Abishai, Jehoshaphat, Jonathan, &c., having been the Hycsos Rulers, called Salatis, Beon, Apachnas, Apophis, &c., accompanied by a biographical and historical table.

From the Society. Transactions of the Philological Society; Nos. 12, 13, and 14, for 1854.

From the Cambrian Archæological Association. Archæologia Cambrensis, No. 6, (third series) April, 1856.

From G. Mansfield Browne, Esq. Twelve coins of the Greek and Roman periods.

From Dr. Macintyre. View of the top of Bold Street, now undergoing alterations, and of St. Luke's Church.

Miss Lamb, of Everton Road, forwarded for exhibition two small Indian figures carved out of soapstone. They had been forwarded by her late brother, Mr. Andrew Lamb. One represents the Hindoo Mars, seated on the back of a peacock; and the other his brother, a corpulent man, with four hands and an elephant's head. Miss Lamb also exhibited a silk purse, used as an envelope by persons of distinction in India. It is sewed inside, and the cord which fastens it at the mouth is enveloped in the seal.

The following paper was then read:—

ON THE CHARACTER OF HAMLET. *By the Rev. Arthur Ramsay, M.A.**

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* Transactions, p. 115.

17th *April*, 1856. SCIENTIFIC SECTION.

J. T. Danson, Esq., V.P., in the Chair.

The following Donations were laid upon the table:—

From the Society. Journal of the Geological Society, vols. v, vi, vii, viii, ix and x.

From the Society. Transactions of the Philological Society, Nos. 12 and 13 for 1855.

From the Society. Journal of the Statistical Society, vol. viii, part 4, December, 1855.

From the Editor. The Poetical Works of William Drummond, of Hawthornden, edited by W. B. D. D. Turnbull, Esq.; London, 1856.

From John Hartnup, Esq. Report of the Liverpool Observatory, for the year 1855.

From Mr. J. R. Isaac. A wooden platter, with a crowned figure in the centre, supported by two dolphins, and round the border birds and fruit.

A portion of two guns, fixed together, taken by Mr. Isaac from the fire at the Tower of London.

Thomas Wyndham Jones, Esq., of Nantwich, exhibited the following articles:—

The knife and fork of Mrs. Elizabeth Milton, mentioned in the inventory (vol. vii, p. 30*) as "a toter shell knife and fork, with sundry others." They are deposited in an oak case, made from the beam of a cottage in Nantwich, which was the inheritance of Humphrey Milton the elder and Humphrey Milton the younger, and adjoined a Baptist Chapel, in the yard of which Mrs. Milton was interred.

Skull of the Indian wild hog.

Helmet found in a field near Acton Church, Nantwich, the scene of a battle, *temp.* Charles I.

Portion of a chain-shot, found several feet below the surface in Nantwich, during an excavation for sewerage purposes.

A horse shoe, found at the same time and place.

An ancient steel box, which had belonged to a family in Cheshire.

An Oriental hookah stand.

Mr. Jones also exhibited the following ancient documents:—(1) A warrant of Privy Seal, 28 Henry III, for letters patents to make Thomas Griffiths, Welshman, a denizen. (2) Grant from Edward, Prince of Wales, to Rhys ap Griffith of £40 a-year, and also of 40 marks a-year, 48 Henry III, as Governor of Droslyn Castle.* (3) Grant from Edward, Prince of Wales, concerning Thomas Praers de Bertomlegh, (French) 9 Edward II. (4) Agreement by Philip de Somerville † with Edward his heir, on his conveyance of some manors in Staffordshire and Nottinghamshire.

* The origin of Droselan, otherwise Dryslyn, Castle, in Caernarvonshire, seems to be involved in great obscurity, although it is conjectured to have been built by the Princes of Dynevor for protecting their adjacent possessions against the incursions of their enemies. Its ruins stand in a very bold situation; the view from which, over the beautiful vale of Towy, cannot be surpassed for variety and grandeur of scenery throughout South Wales. That brave English warrior, Nicholas, fourth Baron Stafford, in an expedition in which he was engaged (1287) against Sir Rese ap Griffith, Governor of that Fortress, (under the annexed royal appointment nearly 600 years old), was killed by the walls thereof falling upon him.

† Sir Philip de Somerville, named in the accompanying ancient charter, was descended from Sir Gualter de Somerville, who came over to England with King William the Conqueror, which monarch bestowed on Sir Gualter very large possessions. In the reign of King Edward the Third Sir Philip held of the Earls of Lancaster, Lords of the house of Tutbury in Staffordshire, amongst other estates, the manor of Thicham, in that county, once celebrated for its singular flitch of bacon custom, like to that of Dunmow in Essex, recently revived by the exertions of Mr. Harrison Ainsworth.

The Chairman read an extract from the Report of the Liverpool Observatory, to the effect that the Secretary of the British Association for the Advancement of Science had agreed to allow the use of its tables and plates to one of our local societies, in illustration of the results of the Liverpool Anemometer. Proof impressions were laid on the table.

The following papers were then read:—

ON THE MEANS OF TESTING MARINE METEOROLOGICAL INSTRUMENTS. *By John Hartnup, Esq., V.P.**

RESULTS DEDUCED FROM OBSERVATIONS TAKEN WITH THE SELF-REGISTERING ANEMOMETER AND RAIN-GAUGE, AT THE LIVERPOOL OBSERVATORY, DURING 1852, '53, '54, '55. *By John Hartnup, Esq., V.P.* †

1st *May*, 1856. ARCHÆOLOGICAL SECTION.

THE REV. DR. THOM, V.P., in the Chair.

The following gentlemen were duly elected members of the Society:—

Rev. H. Parr, M.A., Vicarge, Taunton.
John Billington Booth, Esq., Preston.

The following Donations were laid upon the table:—

From the Society. Transactions of the Ossianic Society, vol. ii. The Festivities of the House of Conan of Clan Sliebh, in the County Clare; Edited by Nicholas O'Kearney, Esq.

From the Society. Journal of the Kilkenny Archæological Society. Nov., 1855; January, 1856.

From the Society. Memoires de la Societié des Antiquaires de l' Ouest; 1854.

From the Society. Bulletin de la Societié Archæologique de l' Orleanais, No. 23.

From the Archæological Institute. Journal of the Institute, No. 48, for December, 1855.

From the Royal Institution. Report of the Royal Institution for 1855.

From the Free Public Library and Museum Committee. Catalogue of the Library, new edition, 1855.

From the Editor. A Catalogue (with the title pages in full, and illustrative extracts) of Books chained to an old case in St. Anne's Church, Turton, and of a similar collection at Gorton, bequeathed by Humphrey Chetham; Edited by Gilbert J. French, Corr. Mem. S. A. Scot. for the Chetham Society.

From Dr. Kendrick. Antiquarian Slips from the local Notes and Queries in the *Warrington Guardian*.

From Alfred Jon. Dunkin, Esq. Archæological Mine, and History of Kent, parts xxviii, xxix, xxx, xxxi.

From J. N. Crosse, Esq. Rubbing from an ancient brass in the Church of St. Mary, Redcliffe, Bristol, exhibiting John Jay, alderman, his wife, six sons and eight daughters, 1480.

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* Transactions, p. 109. † Transactions, p. 212.

From Dr. Thom. Two additional numbers of the Rambler; Liverpool, 1837.

From an unknown donor. A religious notice, in the form of a play-bill, said to have been posted on the Surrey Theatre, by the Rev. Rowland Hill.

The Secretary laid upon the table a volume for which the Society had subscribed. "'Inventorium Sepulchrale,' an Account* of some Antiquities, dug up in the County of Kent, from 1757 to 1773. By the Rev. Bryan Faussett. Edited from the original MSS. in the possession of Joseph Mayer, Esq., by C. Roach Smith, F.S.A., author of '*Collectanea Antiqua*,' 1856."

Dr. Hume exhibited two gutta-percha gilt seals, part of a collection which he had received from John Hopkins, jun., Esq., of Great Grimsby. The one was the common seal of Oswestry, containing a punning allusion to the name of the town; the other was the Episcopal seal of Richard, [Fleming] Canon of Lincoln, and Bishop in 1420.

Mr. McQuie laid upon the table an engraving showing the French Squadron, commanded by M. Thurot, lying at anchor in Ramsey Bay, after their capture by Elliot, 28th February, 1760. Taken from the original painting by Richard Wright, and by him dedicated to the Mayor, Corporation, and Merchants of Liverpool.

Mr. Crosse exhibited a rubbing from a brass in the Church of St. Mary, Redcliffe, Bristol, representing the brother of Sir Thomas Mead, his wife and daughter, 1520.

The Rev. Thomas Moore exhibited a medallion *temp.* Charles I, the property of Mr. Gath.

The following Paper was then read:—

ON THE ETHNOLOGY OF SOUTH BRITAIN, AT THE EXTINCTION OF THE ROMAN GOVERNMENT IN THE ISLAND.† *By Thomas Wright, M.A., F.S.A., &c.*

8th May, 1856. LITERARY SECTION.

J. T. DANSON, Esq., V.P., in the Chair.

William Henderson, Esq., of Church street, was duly elected a member of the Society.

John Chapman, Esq., of Hill End, Mottram in Longdendale, late High Sheriff of Cheshire, having signified his wish to remain connected with the Society, was enrolled without election or entrance fee, in accordance with Law xiii.

The following Donations were laid upon the table:—

From the Society. Journal of the Statistical Society, vol. xix part 1, 1856.

From John Mather, Esq. Notes and Queries,‡ vols. xi and xii, 1855.

From David Lamb, Esq. Athenæum, for 1855, in continuation of former donations.

From the Editor. Pamphlet on National paper money, as a legal tender in payment of debts and taxes, 1856.

Mr. Crosse, F.S.S., exhibited a snuff-box from the keel of the Golden Horse frigate, sunk by Van Tromp, in the Royal Naval Yard Chatham, 1666. It was found while excavating in 1824.

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* This Volume is richly illustrated, with a portrait, map, woodcuts, and numerous plates, coloured and uncoloured.

† Transactions, p. 141.

‡ In volume vii, p. 20* a previous Donation is announced as "five volumes." It should have been *ten* volumes, (i to x) for five years, (1850-54.)

Mr. Crosse also exhibited some Roman Coins of the early Emperors.

In illustration of a portion of Macauley's England, Mr. H. A. Bright exhibited two documents. (1) An Autograph proclamation of General Schomberg, dated Lisburn, 1690, shortly before the Battle of the Boyne; (2) A Treasury warrant of William iii countersigned Stephen Fox; concerning the reimbursement of Robert Lord Lucas as to his expenses, "in sending down ten gentlemen (late prisoners in the Tower,) into Cheshire and Lancashire." These were, George* Lord Viscount Molyneux, Sir Thomas Clifton, Sir William Gerard, Sir Rowland Stanley, Sir Thomas Stanley, Peter Leigh of Lyme, Bartholomew Walmsley and William Dicconson, Esqrs.

Mr. Crosse read an extract from a letter, in allusion to the beautiful church of Fairford in Gloucestershire, the twenty-eight windows of which were fitted with stained glass, procured by John Tame, Esq., in 1498.

The following paper was then read:—

ON THE RISE AND PROGRESS OF THE MANUFACTURING TOWNS OF LANCASHIRE AND CHESHIRE.† *By David Buxton, Esq.*

15*th May*, 1856. SCIENTIFIC SECTION.

REV. DR. THOM, V.P., in the Chair.

The following Donations were laid upon the table:—

From the Society. Proceedings of the Royal Society, vol. vii (Nos. 17, 18, 19, 20.)

From the Society. Transactions of the Philological Society, Nos. vii, viii, ix, x, xi, 1855.

From the Society. Proceedings of the Ashmolean Society, Oxford, 1855.

From Robert Rawlinson, C.E., F.G.S. Report of the General Board of Health on a Preliminary Inquiry respecting,

Southport, Lancashire, 1855.
Camborne, Cornwall, 1855.
Smethwick, Staffordshire, 1855.
Ulverstone, Lancashire, 1855.

From the Author. Sur l' Etablissement d 'une langue Universelle; Discours Prononcé a la Rentrée Solennelle, des Facultes de l' Academie de Caen. Par M. A. Charma, Professeur de Philosophie, &c., Paris 1856.

From Thomas G. Wedgwood, Esq. A volume entitled "Dr. Sacheverell's Tryall," consisting of five folio tracts, 1710.

From James Stonehouse, Esq. The Borough Fund of the Corporation of Liverpool, in account current with John Wybergh, Treasurer, for the years 1847, '48, '49, '50, '51, '53, '54, '55.

From William Dobson, Esq. Authentic Records of the Guild Merchant of Preston, in the year 1822, with an introduction by J. Wilcockson. Preston 1822.

From the Society. Proceedings of the Royal Geographical Society, Nos. 1 and 2.

From the Society. Journal of the Geological Society of Dublin, vol. vii, parts 1 and 2.

From the Editor. Songs and Carols, from a MS. in the British Museum, of the 15th century. Edited for the Warton Club, by Thomas Wright, M.A., F.S.A., 1856.

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* Caryll [?]
† Transactions, p. 199.

From the Editor. The Farington Papers; edited for the Chetham Society, by Miss Farington, 1856.

From the Committee of the late Church of England *Institute. Parliamentary Papers, viz.—Reports, 21 vols.; Journals of the Lords, 29 vols.; Journals of the Commons, 101 vols.; Miscellaneous, 13; Total 164 vols.

Mr. Crosse exhibited an ancient black letter Chronicle, containing details of English History from 1108 B.C. to 1578 A.D.; also Sylvanus Morgan on Geometry or Dialling, 1652.

Mr. John Peacock, of Hough Green, Chester, exhibited a large number of Roman and other Antiquities from Chester, some of which had been found so recently as that very day. They embraced the following—

Fibulæ found in Northgate street.
Ditto and Spear Head.
Thuribulum and Spoon.
Silver Coin of Vespasian.
Roman Tile, and part of another Tile, with the letters LEA upon it.
Portion of a Mortarium, with the words MARINUS FECIT.
Roman Stylus (supposed.)
Fibula, from Eastgate street.
Two small Vases.
Antefix, with the letters LEC. XX., and figure apparently of a boar rampant.
Gold Ring, with a Sapphire, from Northgate street.
Coin with inscription "Tetricus" (?)
Irish Farthing of Charles I.
Two Coins of Aurelius.
One supposed Abbey counter.

Mr. Poole exhibited a peculiar breech-loading rifle, self-cleaning, and capable of being fired 400 times in an hour. It is patented by Mr. Bentley.

The Secretary announced that the Excursion of the Society would take place on the 24th of June, to Preston and neighbourhood.

The following papers were then read:—

THE ANCIENT GEOMETRICAL ANALYSIS, ILLUSTRATED FROM THE WRITINGS OF THE LANCASHIRE GEOMETERS.† *By Thos. T. Wilkinson, F.R.A.S.*

ON SOME OF THE RECORDED CHANGES IN THE LIVERPOOL BAY, PREVIOUS TO THE YEAR 1800.‡ *By Joseph Boult, Esq.*

The author, amongst other illustrations, exhibited a chart upon which were laid down the lines of high and low water mark, for the years 1689, 1755, 1813, and 1847; from which it appeared that the coast line from the Rock point to Dove point receded in the first interval, but that the low water line from the Rock point to Leasowe Castle advanced. Westwardly of the Red Noses the advance was considerable; on the other hand westward of the castle and in Hoylake, low water mark has receded. There are remarkable changes also on the north side of the Channels, the Burbo bank of Collins's survey being split up into several patches on Eyes's chart. In place of the shelf or bar stated by Collins to be all dry at low water, and extending from Dove spit to Burbo bank, Eyes gives a channel of from one and a half to seven fathoms deep.

The author then entered upon the subject of the coast at Wallasey Leasowes, and

* By the "Literary and Scientific Institutions Act," (17 and 18 Vic. cap. 112, sec. 30,) it is enacted that when any such society is dissolved, its remaining property shall be handed over to some other society or societies, for the promotion of similar objects.

† Transactions p. 75.

‡ The reading of this paper was omitted, owing to the lateness of the hour. The following is an abstract.

reviewed the evidence in favor of the received opinion that an ancient lighthouse existed there. He entered into the subject in considerable detail, quoting various writers and acts of parliament, and concluded that the so called old lighthouse must have been a shortlived twin brother of the patriarch who still holds his ground at Wallasey Leasowes, having no existence prior to 1761, and probably being defunct and washed away within a few years afterwards.

On the Eastern margin of the Bay considerable changes also had taken place, between the date of Collins's survey and the year 1800. The channel had moved nearly its own breadth, or 1200 yards westward. In the course of his investigations, the writer had stumbled upon traces of a village named Altmouth, situated at the junction of the river Alt and the sea. This village is mentioned by Camden. Mr. Edward Littledale had politely afforded the opportunity of examining the records of the Alt commission in their printed volume. From these it appeared that formerly considerable apprehensions were experienced lest a portion of the locality might be inundated, in consequence of the shifting of the sandhills, which formed a secure barrier. Measures were therefore adopted to prevent the moving of the hills. Mr. Boult conjectured that the village had been deserted in some panic, or had possibly been overwhelmed by some sand drift, as at Nineveh, and so deserted and lost.

CONCLUDING ADDRESS. *By J. T. Danson, F.S.S., V.P.*

Gentlemen, called to address you on the close of an eighth session, I find the task as easy and agreeable as it is honorable. I have nothing to remind you of that is not pleasant to remember. We still prosper; and our prosperity exhibits all the conditions of a natural and permanent progression. It is alike removed from the zeal that leads to exhaustion and the indifference that augurs decay.

The Session has afforded us 20 meetings, and we have heard read and have discussed as many papers: some of them admirable alike in design and execution, and all of them worthy of the attention they have received. I shall make no effort to place these papers in the order of their respective merits. Where, as here, excellence is in any degree general, particular eulogy, awarded on the dictum of individual taste, might well be deemed invidious. Nor would I willingly move one step towards enduing the friendly competition hitherto so fruitful of good, with the meaner aspect of personal rivalry.

Their subjects have had relation, more or less distinct, to our three lines of study—Archæology, Literature, and Science – in proportions not very far from equal. Such difference as there is, however, affords some ground for the inference that Archæology, our first chosen subject, is receiving least, and science, our last chosen, receiving most attention. In view of the care and skill constantly evinced by our honorary secretary in the arrangements for our meetings, this preponderance, slight as it is, can hardly be deemed accidental. And perhaps we should do well to receive it as a warning that, in proportion as our Society expands its operations, the topics most nearly allied in character with the interests of the passing moment are likely, if our archæological and literary members do not come to our rescue, to usurp an undue share of our time. And it were surely not well that the hours we spend here, saved—as for most of us they must be—from days of needful and unchosen labour, should be devoted, in anything more than their due proportion, to topics suggested by, or suggestive of, the very toil from which we here seek relaxation. Having myself aforetime been somewhat urgent in favor of our scientific section, it may the better become me to mark the earliest indication of any such tendency.

Touching more generally the results of the Session, I am conscious that I shall best interpret the sense of the Society in speaking with much modesty. All we have yet achieved must needs be dwarfed by comparison with what we have openly proposed, and do earnestly propose, yet to do. Thus much I may say—that our numbers have been largely increased, and that, as the forthcoming volume of our Transactions will prove, the larger body has displayed a commensurate increase of activity and power.

In our Archæological Section, the earliest periods of British history have received additional illustration from Mr. Hinde's paper on The Ancient History of Northumbria, and Mr. Harwicke's on The Roman Remains at Walton-le-dale; and the mediæval and modern periods, find able contributions in Mr. Marsh's Account of the Warrington Grammar School, Mr. Stonehouse's Day in Low Furness, and Mr Boardman's Notes on Liverpool a Hundred Years ago.

The papers of the Literary Section have been even more various. Mr. Buxton on The Saxon Element in Poetic Composition, and Mr. Ramsay on The Character of Hamlet, have given to criticism the first place. We are also indebted to Mr. Buxton for an historical paper on The Rise of the Manufacturing Towns of our District, and to Mr. Moore for a practical and philosophical essay on The Poor-law System as it affects Education and Morals; while Mr. Dove's exhibition of, and comments on, some original letters of Dr. Franklin have contributed to render more vivid and more truthful our conceptions of the character of that great man. In the statistical—the least inviting—department of the Section, we have had two elaborate papers on the population of Liverpool and of the Manchester District.

The Scientific Section has received from Mr. Tudor some valuable Zoological Notes on the Banks of the Mersey; from Mr. Moore illustrations of several curious facts connected with mammalia; and from Mr. Gregson the continuation of a remarkable paper on The Lepidoptera of the Liverpool District. In microscopic botany, we are indebted to Mr. Sansom for a precise description of a fungoid disease in the pear. Mr. Hartnup has favored us with an excellent practical description of the best marine meteorological instruments, and of the means of testing their accuracy—a subject, the importance of which in this locality can hardly be over-estimated; and has also given to us the results obtained during four years, from the self-registering anemometer and rain gauge. And in two of the most important papers read during the Session, (those of Dr. Oppert, on The Cuneiform inscriptions of Ancient Babylon, and of Mr. Wright, on The Ethnology of Britain at the close of the Roman Period,) we have had gratifying evidence of the recognition of our labours by men to work in association with whom is itself an honor. Of the paper read this evening it were needless of me to say one word. It is before you and you have shown that you know all its value.

This enumeration cannot be made without some feeling of pride; but it is of more importance to remark that there may—unless I am much mistaken—be gathered from the records of the closing Session evidence in no degree faint or doubtful that there is amongst us a very general disposition to use, and to seek to increase, our knowledge for purposes ever growing higher and wider as we advance—a better, a more elevated, and a more just appreciation of the value of knowledge for its own sake, and of the very search for it as an ennobling means of mental discipline. To wish that this tendency may gather strength with every succeeding Session, and that under its influence we may continue to regard the future with hopes ever growing brighter and better founded as we proceed, is only to desire that our Society may realise at once its legitimate destiny, and the loftiest to which we can reasonably aspire.

Thanks were then voted to the Rev. Dr. Thom and Mr. Danson, as the two vice-presidents who had been most frequently in attendance. Thanks were also voted to Dr. Hume, and the proceedings terminated.

APPENDIX.

EXCURSION TO PRESTON.

On Tuesday the 24th of June, the members and their friends undertook an excursion to Preston; in compliance with the expressed wish of several gentlemen connected with that town. The party left Liverpool by an early train, and arrived at Preston shortly after nine o'clock. A local committee of which Mr. W. Dobson was secretary, had made arrangements for the day, and several of its members attended at the station to receive the visitors. Other members of the Society, from Manchester, Lancaster, Warrington, Burnley, &c., joined them shortly afterwards.

The committee had brought together, for the occasion, an interesting collection of local objects; forming a temporary Museum, illustrative of Preston and its neighbourhood.* These were laid out in the rooms of the Institution Avenham, the use of which had been granted for the purpose of the meeting. The inspection of the collection was the first part of the proceedings: and here the visitors were joined by a large number of ladies and gentlemen of Preston and the neighbourhood.

An adjournment then took place to Dr. Shepherd's† library in the same building, where a *dejeuner* was prepared by the hospitable arrangements of the local committee. Before retiring, the company resolved that they would confine their attention to Walton-le-dale and Penwortham; leaving their visit to Ribchester to take place on some other occasion.

Crossing the Ribble from Avenham Terrace, the party proceeded to Walton, distant about a mile. Here the precise positions were pointed out in which the Roman remains‡ had been discovered; and Mr. Hardwick drew attention to the terraces, the former bed of the river, &c. Engravings of the subject were handed round for inspection; and some of the objects themselves, which had not been procured for public purposes.

A pleasant walk along the bank of the river brought the company to Penwortham, about an equal distance on the other side of the town. Permission had been obtained, to examine the extraordinary mound known as the "Castle Hill," on which a Saxon castle is said to have stood. A large trench had been cut on the previous day, under the superintendence of Mr. Willacy, the agent for the property. Objects in wood iron and lead had been discovered, with numerous bones of animals. On this occasion, a wooden structure of oak and hazel was discovered; apparently the framework of a house inside the hill. The floor was paved with river boulders. [The excavations were continued on the following day, when several additional objects were brought to light, including a complete spur, apparently of about the 10th century.] An account of them, with illustrations, will be given in the next volume of the Society's transactions.

Returning to Preston at four o'clock, between fifty and sixty ladies and gentlemen sat down to dinner in the Assembly-room of the Bull Hotel. The chair was occupied by Richard Threlfall, Esq., Mayor of Preston. Several interesting sentiments were proposed and suitably responded to. The members from a distance retired in time to meet their respective trains; and the company separated finally about eight o'clock.

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* The principal contributors were, the Mayor, the Town Clerk, Miss Farington of Worden, R. Townley Parker, Esq., M.P., the Ribble Company, the Council of the Institute, the Rev. W. Thornber, Mr. Dearden, Mr. Hardwick, Mr. Hoghton of Bold, Alderman Brown, &c.

† Dr. Shepherd was Mayor of Preston in 1756.

‡ Transactions, p. 127.

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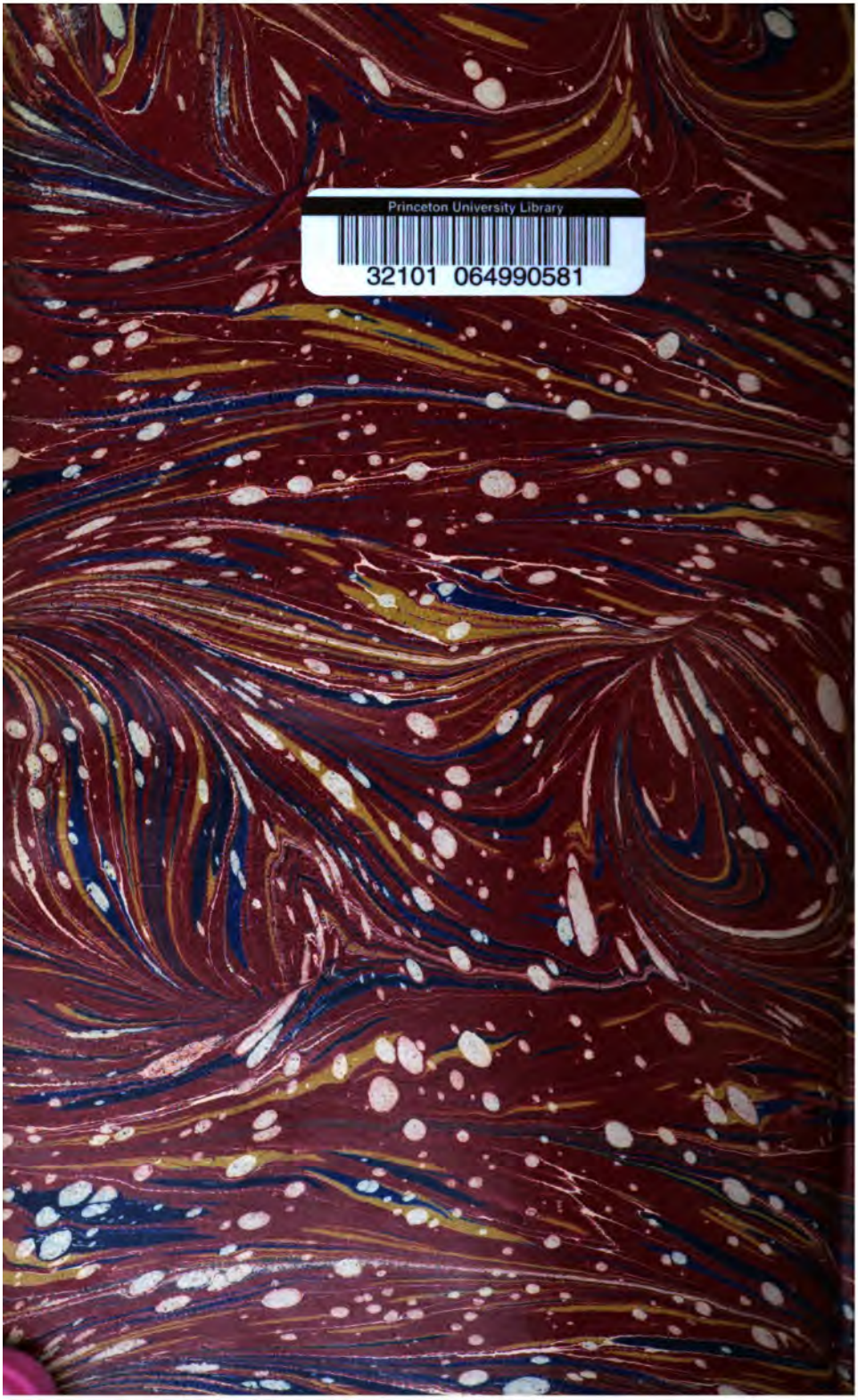
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